

**United States Department of the Interior
Bureau of Land Management**

**Environmental Assessment
of the Focus Ranch Unit Geographic Area Plan (GAP)**

Little Snake Field Office
455 Emerson Street
Craig, Colorado 81625

DOI-BLM-CO-N010-2013-0016-EA



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CHAPTER 1 - INTRODUCTION

1.1 IDENTIFYING INFORMATION

CASEFILE/PROJECT NUMBER: COC63212X

PROJECT NAME: Focus Ranch Unit Geographic Area Plan (FRU GAP)

PROPONENT: Entek GRB LLC (Entek)

BACKGROUND: This Environmental Assessment (EA) has been prepared by the BLM to analyze four (4) Applications for Permit to Drill (APDs) oil wells and associated access routes located in the exploratory Focus Ranch Unit as submitted by the proponent. The EA will also analyze the re-route (“middle by-pass”) of the existing unit road which would reestablish access to Focus Ranch Unit Federal Wells # 3-1 and #12-1.

A portion of the proposed Geographic Area Plan (GAP) is dedicated to establishing an alternate route to the existing producing wells in the Focus Ranch Unit (FRU). The access road and pad for the Focus Ranch Federal #12-1 well were constructed the summer of 2005 and the well was drilled in 2006. The Federal #3-1 was also drilled in 2006 after the construction of a short access road and pad. Testing of several different completion intervals in the Frontier and Niobrara formations was conducted from 2006-2009 and resulted in the BLM determining that the #12-1 unit obligation well was capable of producing in unit quantities.

The proponent has not had access to the #12-1 since 2009 due to delays associated with the failure of a surface use agreement (SUA) with the surface owner where the existing road traverses portions of the private landowner’s surface. This access has been in litigation since 2011, following several attempts to renegotiate the SUA.

The proponent has proposed the development of an alternate access road to the #12-1 that would relocate the contentious portions of the access to BLM surface. In addition to the access to produce the #12-1, the “middle by-pass” re-route would provide access to portions of the FRU where the proponent holds additional valid leases.

1.2 PROJECT LOCATION AND LEGAL DESCRIPTION

LEGAL DESCRIPTION:

- COC59663, FRU Stull Federal Well #28-2, NWNE, Sec. 28, T. 12 N., R. 88 W., 6th PM, Routt County.
- COC59666, FRU Federal Well #33-13, SWSW, Sec. 33, T. 12 N., R. 88 W., 6th PM, Routt County.
- COC59491, FRU Federal Well #4-14, SESW, Sec. 4 and Federal Well #3-1, SENW, Sec. 3 in T. 11 N., R. 88 W., 6th PM, Routt County.

- COC59203, FRU Federal Well #11-14, SESW, Sec. 11 and FRU Federal Well #12-1, SWSE, Sec. 12 in T. 11 N., R. 88 W., 6th PM, Routt County.
- See Appendix B for Maps & Plats.

1.3 PURPOSE AND NEED

The purpose of the Proposed Federal Action is to allow development of federal oil & gas resources to meet the public's continuing economic demands for a dependable and affordable supply of oil & natural gas, while giving due consideration to the protection of other resource values; and facilitate the leaseholder's rights to develop oil and gas resources within their federal mineral leases in accordance with the Mineral Leasing Act of 1920, as amended.

The requested Federal Action is needed to provide access across federal lands managed by the BLM to allow for development of federal minerals within an existing federal unit, according to the principles of multiple use, while maintaining the rights and obligations of other users and protecting resources in the project area. In addition, the requested Federal Action is needed to re-establish access to the existing Focus Ranch Federal #12-1 for the purposes of testing and production. The surface use agreement with the landowner where the original access road lies is no longer viable.

1.3.1 Decision to be Made

The BLM has prepared this EA to analyze whether or not to approve the 4 APDs and the sundry notice proposing a by-pass of privately owned land, and under what terms and conditions.

1.4 PLAN CONFORMANCE REVIEW

The Proposed Action was reviewed for conformance (43 CFR 1610.5, BLM 1617.3) with the following plan:

Name of Plan: Little Snake Record of Decision and Resource Management Plan (RMP)

Date Approved: October 2011

Decision Language: The Proposed Action is in conformance with the LUP because it is specifically provided for in the following LUP goals, objectives, and management decisions:

- Allow for the availability of the federal oil and gas estate (including coalbed natural gas) for exploration and development. Objectives for achieving these goals include:
- Identify and make available the federal oil and gas estate (including coalbed natural gas) for exploration and development.
- Facilitate reasonable, economical, and environmentally sound exploration and development of oil and gas resources (including coalbed natural gas).

Section/Page: Section 2.13 Energy and Minerals/ page RMP-36

Other related documents that cover the proposed action:

Name of Plan: Colorado Oil and Gas Leasing & Development Final EIS Plan Amendment

Date Approved: October 1991

Section/Page: Record of Decision for the Oil and Gas Plan Amendment to the Little Snake Resource Management Plan/EIS, Chapter 2/ page 11.

Summary of Applicable Lease Stipulations from ROD for Oil and Gas Plan Amendment:

<i>Lease Number</i>	<i>Well Number</i>	<i>Stipulation</i>
COC59203 (1996)	FRU Federal Well #11-14, FRU Federal Well #12-1	None
COC59491 (1996)	FRU Federal Well #4-14, Federal #3-1	None
COC59663 (1996)	FRU Stull Federal Well #28-2	Timing Limitation (TL) to protect Big Game Winter Range: No construction, drilling, or well completion activities will be allowed between December 1 through April 30
COC59666 (1996)	FRU Federal Well #33-13	TL to protect Big Game Winter Range: No construction, drilling, or well completion activities will be allowed between December 1 through April 30

1.5 SCOPING PROCESS

1.5.1 Scoping: NEPA regulations (40 CFR §1500-1508) require that the BLM use a scoping process to identify potential significant issues in preparation for impact analysis. The principal goals of scoping are to allow public participation to identify issues, concerns, and potential impacts that require detailed analysis.

External Scoping Summary:

The Notices of Staking (NOSs) have been posted in the public room of the Little Snake Field Office (LSFO) for a 30-day public review period beginning 2011 when the NOSs were received, and may be viewed during regular business hours (7:45 a.m. to 4:30 p.m.), Monday through Friday, except holidays.

Issues Identified: No issues were identified by persons/agencies consulted during public scoping.

Persons/Agencies Consulted: Colorado Parks & Wildlife (CPW), Colorado Oil & Gas Conservation Commission (COGCC), Routt County Planning, Uintah and Ouray Tribal Council, Colorado Native American Commission, and Colorado State Historic Preservation Office.

Internal Scoping Summary: Onsite inspections of the proposed project area were conducted in May 2012 and in July 2012 for the unit road re-route. In attendance were a BLM ID Team, a representative from COGCC, representatives from Entek Energy and their contractors, and the landowners/permittees.

Issues identified: access and traffic, wildlife habitat and disturbance, livestock disturbance, reclamation, surface water and ground water protection, and noise mitigation.

The action in this Environmental Assessment (EA) is included in the NEPA log posted on the LSFO web site:

http://www.blm.gov/co/st/en/BLM_Information/nepa/lsfo.html.

The EA was posted for a 30-day public comment period beginning 07/03/13.

Issues identified:

CHAPTER 2 - PROPOSED ACTION AND ALTERNATIVES

2.1 INTRODUCTION

The purpose of this chapter is to provide information on the Proposed Action and Alternatives. Alternatives considered but not analyzed in detail are also discussed.

2.2 ALTERNATIVES ANALYZED IN DETAIL

2.2.1 No Action Alternative

The No Action alternative would be to reject the APDs and access road re-route. Under this alternative, the wells would not be drilled and the pads, access roads, and facilities would not be constructed. In addition, the proponent would continue to be unable to access the existing FRU Federal Wells #3-1 and #12-1.

2.2.2 Proposed Action

The Proposed Action is to approve 4 APDs and a re-route of the main access road as submitted by Entek. The proponent proposes to drill the following wells from federal surface into federal minerals:

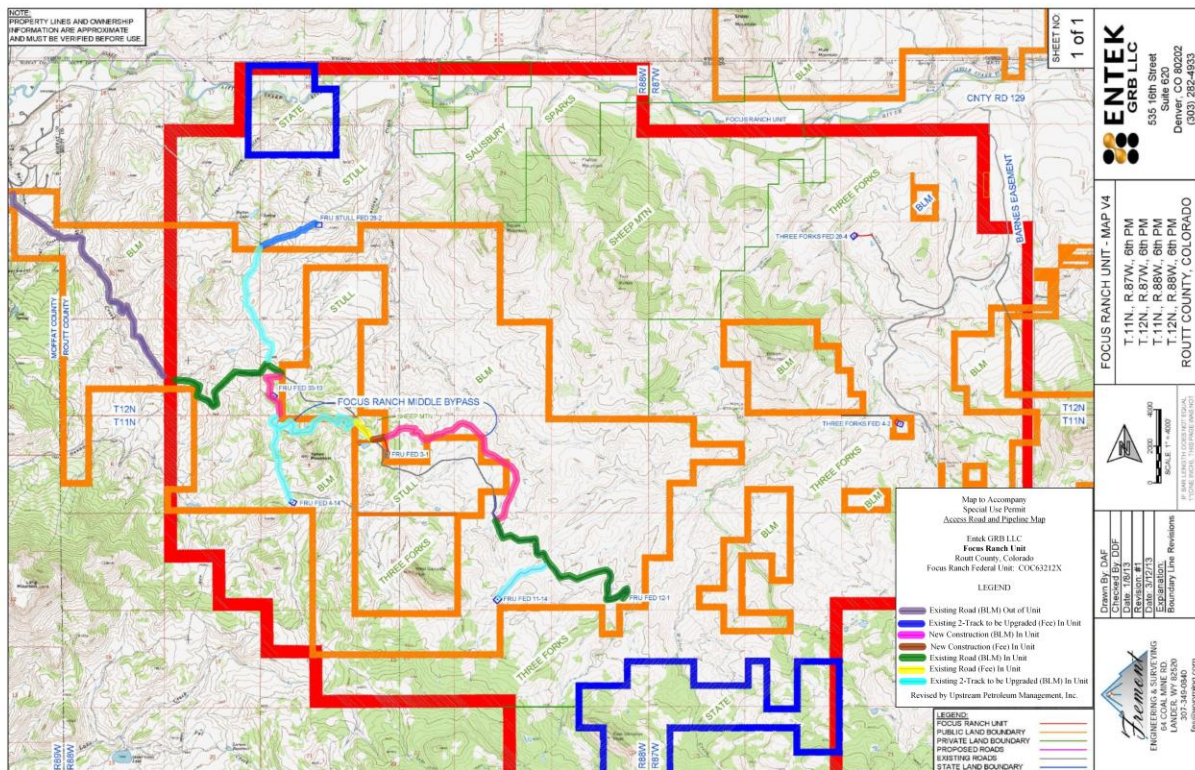
- COC59666, FRU Federal Well #33-13, SWSW, Sec. 33, T. 12 N., R. 88 W., 6th PM, Routt County.
- COC59491, FRU Federal Well #4-14, SESW, Sec. 4, T. 11 N., R. 88 W., 6th PM, Routt County.
- COC59203, FRU Federal Well #11-14, SESW, Sec. 11, T. 11 N., R. 88 W., 6th PM, Routt County.

The proponent proposes to drill the following well from privately owned surface into federal minerals.

- COC59663, FRU Stull Federal Well #28-2, NWNE, Sec. 28, T. 12 N., R. 88 W., 6th PM, Routt County.

The proponent proposes to re-enter the following wells from federal surface into federal minerals.

- COC59203, FRU Federal Well #12-1, SWSE, Sec. 12, T. 11 N., R. 88 W., 6th PM, Routt County.
- COC59491, Federal Well #3-1, SENW, Sec. 3, T. 11 N., R. 88 W., 6th PM, Routt County.



Map 1

The Proposed Action would be located in the FRU, approximately 25 miles east of the town of Baggs, WY via HWY 70 and a few miles to the southeast of Slater, CO. A Geographic Area Plan (GAP) containing 4 APDs for the oil wells and a Sundry Notice for the FRU road re-route have been filed with the LSFO. The GAP includes drilling and surface use plans and engineered road and well pad designs that cover mitigation of impacts to vegetation, soil, surface water, and other resources. Mitigation not incorporated by Entek in the drilling and surface use plan would be attached to the approved APDs by the BLM as Conditions of Approval (COAs) and can be found in Attachment A.

Construction work on the FRU road “middle by-pass” re-route to re-establish access to the Focus Ranch Federal #3-1 and #12-1 wells is anticipated to be completed in 30 days with the use of 2 construction crews. Workover rig activities would begin on FRU Fed #12-1 to test various intervals as soon as the road construction is complete. Entek plans to drill and complete up to 2 additional wells (included in the GAP) during the 2013 season. Access roads and well pad locations would only be constructed if the drilling of the additional wells could be completed within the calendar year.

During 2014, Entek proposes to drill and complete the remaining wells in the GAP, additional workover, stimulation, and testing of the wells completed in 2013. Entek would also commence pipeline and utility construction depending on well production results.

Table 1, ESTIMATE OF TOTAL AREA OF SITE DISTURBANCE, depicts the approximate acreage of ground disturbance associated with the different components of the Proposed Action.

Table 1. ESTIMATE OF TOTAL AREA OF SITE DISTURBANCE

Well Name	Well Pad Disturbance Initial/After Interim Reclamation	Access Road Disturbance	Approximate Initial Disturbance/ After Interim Reclamation
FRU Stull Fed 28-2	2.8 ac/1.3 ac	9.7 ac using existing 2-track road	12.5 ac/11.2 ac
FRU Federal 4-14	2.3 ac/1.3 ac	5.5 ac using existing 2-track road	7.8 ac/6.8 ac
FRU Federal 11-14	3.3 ac/2.1 ac	3.2 ac using existing 2-track road	6.5 ac/4.4 ac
FRU Federal 33-13	3.0 ac/2.3 ac	1.7 ac using existing 2-track road	4.7 ac/4.0 ac
Federal 3-1 Access Road	n/a	0.9 ac	0.9 ac
FRU Road "Middle By-Pass" Re-route	n/a	28.9 ac	28.9 ac
Total Disturbance	11.4 ac	49.9 ac	61.3 ac/38.9 ac

PROPOSED ACTION PLANNED ACCESS ROADS (See Appendix B Maps & Plats for a complete description of planned access roads associated with the Proposed Action)

All of the proposed access roads would be constructed in accordance with guidelines established in *The Gold Book: Surface Operating Standards for Oil and Gas Exploration and Development*, the minimum standards listed in BLM Manual Section 9113 *Roads Design Handbook*, and shall be constructed under the direction of a qualified construction engineer. Entek has submitted engineered designs for roads and well pads that were reviewed by the BLM's engineering department. The "middle by-pass" would add 4.8 miles of road disturbance. 2.9 miles of original access road exists on private land and is no longer used by the proponent, but is still used by the private landowner.

- Roads would be upgraded or constructed to have a 14'-16'-foot running surface with a total disturbance width of be no more than 50', which would include the pipeline and utilities corridor.
- Borrow ditches would be back sloped to 3:1 or shallower.
- Maximum grades would not exceed BLM standards.
- All access roads would be upgraded and maintained as necessary to prevent erosion and accommodate year-round traffic.
- Surfacing would consist of gravel purchased locally and not removed from public land.
- Construction activities at perennial, intermittent, and ephemeral drainage crossings would be timed to avoid high flow conditions. Construction that disturbs any flowing stream would

utilize either a piped stream diversion or a cofferdam and pump to divert flow around the disturbed area.

- Culverts at drainage crossings would be designed and installed to pass a 25-year or greater storm event. On perennial and intermittent streams, culverts would be designed to allow for passage of aquatic biota.
- The minimum culvert diameter in any installation would be 18 inches.
- Crossing of drainages deemed to be jurisdictional waters of US, pursuant to Section 404 of the Clean Water Act, may require additional culvert design capacity. Due to the flashy nature of area drainages and anticipated culvert maintenance, the US Army Corps of Engineers (USACE) recommends designing drainage crossings for the 100-year event.
- A qualified wetlands consultant would coordinate with USACE to obtain the necessary Section 404 permit for the crossing of Cantling Creek. No disturbance would occur prior to securing necessary permits.
- Felled trees slash, and any other clearing debris would not accumulate outside of the road corridor, unless specifically approved by the BLM. Stumps would be flush cut and timber would be hauled off the project site. Slash would be chipped or lopped and scattered based on the type and volume.
- Gates and cattleguards would be installed where necessary.
- Signs would be installed on access roads per BLM standards.

The estimated equipment needed to complete construction would accommodate two separate crews to finish the main access road construction within 30 days. Intermediate staging for the road construction would be located at the existing Butter Lake Federal #32-10 and Federal #3-1 wells along the existing FRU road.

WELL PAD AND NEW PROPOSED PRODUCTION FACILITIES (See Appendix B Maps & Plats)

The proposed well pad locations would be cleared of all vegetation and leveled for drilling. The resulting topsoil would be stockpiled for use in reclamation activities. Approximately 3.0 acres would be disturbed for construction of each well pad. This would include the 350' by 300' well pad and the topsoil pile. Portions of the production sites that would be heavily used would be graveled for year-round access and additional surface material would be obtained from commercial sources. Production equipment would be painted Shale Green and would be placed to reduce the view from visibility corridors and private residences. Production facilities would be clustered and placed away from cut/fill slopes to allow maximum re-contouring during interim reclamation; no facilities would be constructed off location.

PIPELINES AND FLOWLINES

No pipelines would be authorized at this time; the proponent would need to file a separate Sundry Notice (SN), for separate approval, siting the exact location and specifications of the pipelines. The pipeline construction specifications would be determined upon the drilling, engineering, and completions of new and existing wells. In general, pipelines would be placed as closely adjacent to the access road as possible, routes would be included within the 50' access roads, and all disturbance would be reclaimed after the pipeline trenches were backfilled.

STORMWATER MANAGEMENT (See Appendix C for a the Master Stormwater Management Plan)

Stormwater Management and post-construction disturbance stabilization for the access roads and well pads would be accomplished through stormwater management controls that would be determined by an engineer onsite before construction begins. The Master Stormwater Management Plan and site specific details including installation, maintenance and monitoring schedules and practices can be found in Appendix C. The following Stormwater Management Controls may be applied:

- Diversion ditches/ water bars
- Road surface slope
- Drainage dips roadside ditches
- Turnouts wing ditches
- Road crowing culverts
- Berms
- Silt fence
- Straw bales/ wattles
- Retain existing vegetation
- Mulching materials handling
- Spill prevention
- Vehicle tracking control
- Waste management and disposal
- Groundwater and Stormwater dewatering

LOCATION OF WATER SUPPLY

Water would be transported by truck from the CF &I Corp. location within the Coal Bed Methane play located in the Slater Dome Field (SESW Sec. 13, T. 12 N., R. 89 W.). An alternate source could be trucked from the Little Snake River under existing permits or other available commercial sources under existing permits.

Anticipated water use would be as follows:

- Per well, mud drilling water requirements are anticipated to be approximately 7,900 bbls.
- Road watering would be required for dust abatement if conditions dictate, and would utilize approximately 900 bbls. Only fresh water would be applied to roads and pads.

WASTE DISPOSAL

A 30' by 30' by 15' cuttings pit would be constructed within the cut portion of the well pad. Drill cuttings would be buried when dry. The cuttings pit would be closed in accordance with Colorado Oil and Gas Conservation Commission (COGCC) 900 and 100 Series Rules. The soils are required to meet the concentration levels of Table 910-1 or the soils would be removed to an authorized disposal facility. Produced fluid would be contained in test tanks during completion and testing and no reserve pit would be authorized. Sewage, garbage, and other waste would be handled in accordance with State and local regulations and would not be disposed of on site.

INTERIM RECLAMATION (See Appendix B Maps & Plats)

Initial seedbed preparation would include backfilling and contouring of all cut/fill slopes within the disturbed area. Topsoil would be evenly redistributed and aggressively re-vegetated over the disturbed areas not needed for all-weather operations including road cut/fills and to within a safe distance of the production facilities. An access road, "teardrop" turnaround driveway, and facilities area would remain leveled and graveled through the production of the well.

Final seedbed preparation would consist of contour cultivating to a depth of 4” to 6” within 24 hours prior to seeding and seeding would be conducted no more than 24 hours following completion of the final seedbed preparation. A certified weed-free seed mix would be used on all disturbed surfaces including road cut/fill slopes.

The anticipated seed mixture for this location is:

Plant Species	Lbs. of Pure Live Seed (PLS) per acre
Western wheatgrass	2
Slender wheatgrass	2
Bluebunch wheatgrass	2
Mountain brome	1
Squirreltail	1
Western yarrow	0.5
Scarlet globemallow	0.5
Arrowleaf balsamroot	0.5
Total	9.5

FINAL RECLAMATION

Final reclamation of the entire access road and well pad location would be conducted upon termination of operations. The wellbore would be properly plugged and all equipment removed. The access road and well pad would be re-contoured to the original landscape. Re-salvaged topsoil would be spread evenly of the entire disturbed area and seedbed preparation would occur again as previously described in the Interim Reclamation section.

The anticipated seed mixture for this location is the same as described for Interim Reclamation above.

RECLAMATION STANDARDS (See Appendix A for COAs)

Actions would be taken by the proponent to ensure that reclamation standards are met as quickly as reasonably practical. Reclamation monitoring would be documented in an annual reclamation report submitted to the Authorized Officer (AO) by December 31. Any time 30% or more of a reclaimed area is re-disturbed, monitoring would be reinitiated.

A self-sustaining, vigorous, diverse, native plant community would be established on the site, with a density sufficient to control erosion and non-native plant invasion and able to reestablish wildlife habitat or forage production. At a minimum, the established plant community would consist of species included in the seed mix and/or desirable species occurring in the surrounding natural vegetation. No single species would account for more than 30% total vegetative composition unless it is evident at higher levels in the adjacent landscape. Permanent vegetative cover would be determined successful when the basal cover of desirable perennial species is at least 80% of the basal cover of the adjacent undisturbed area.

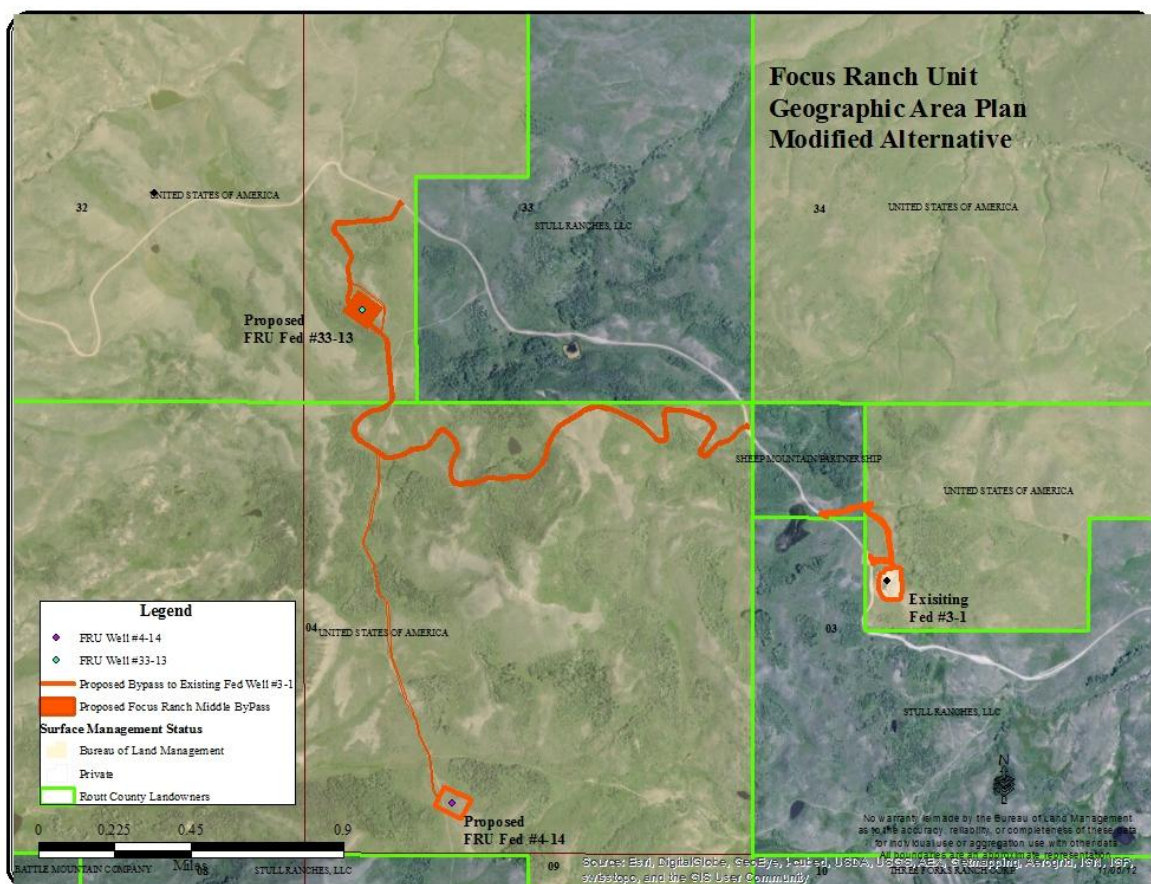
2.2.3 Modified Proposed Action

The Modified Proposed Action would be to approve 2 APDs and a portion of “middle by-pass” re-route of the main access road, as submitted by Entek, to provide access only as far as the

existing 3-1 well. All the construction and reclamation plans described in the previously in the Proposed Action would remain the same for the following proposed wells.

The proponent proposes to drill the following wells from federal surface into federal minerals:

- COC59666, FRU Federal Well #33-13, SWSW, Sec. 33, T. 12 N., R. 88 W., 6th PM, Routt County.
- COC59491, FRU Federal Well #4-14, SESW, Sec. 4, T. 11 N., R. 88 W., 6th PM, Routt County.
- COC59491, Federal Well #3-1, SENW, Sec. 3, T. 11 N., R. 88 W., 6th PM, Routt County.



Map 2, Modified Alternative

Table 2, ESTIMATE OF TOTAL AREA OF SITE DISTURBANCE, depicts the approximate acreage of ground disturbance associated with the different components of the Modified Proposed Action.

Table 2. ESTIMATE OF TOTAL AREA OF SITE DISTURBANCE

Well Name	Well Pad Disturbance Initial/After Interim Reclamation	Access Road Disturbance	Approximate Initial Disturbance/ After Interim Reclamation
FRU Federal 4-14	2.3 ac/1.3 ac	5.5 ac using existing 2-track road	7.8 ac/6.8 ac
FRU Federal 33-13	3.0 ac/2.3 ac	1.7 ac using existing 2-track road	4.7 ac/4.0 ac
Federal 3-1 Access Road	n/a	0.9 ac	0.9 ac
FRU Road Re-route	n/a	13.3 ac	13.3 ac
Total Disturbance	5.3 ac/3.6 ac	29.5 ac	26.7 ac/25.0 ac

2.3 ALTERNATIVES CONSIDERED BUT NOT ANALYZED IN DETAIL

2.3.1 Additional Alternative Access Routes

The proponent proposed re-routing the FRU access road to the north, crossing Cantling Creek in Sec. 27, T12N-R88W and to be sited entirely on BLM-managed surface lands. The proposed access road would have been located within 0.26 miles of the Squaw Mountain greater sage-grouse lek and would have added over 4.5 miles of new road in greater sage-grouse priority habitat. At the time of the original proposal, location of the road was just outside the sage-grouse lek No Surface Occupancy (NSO) stipulation (0.25 miles) and was in conformance with the 1986 LSFO RMP and the 1991 Oil and Gas Amendment, however, the proposed route would have led to undue and unnecessary degradation of BLM lands. This route also raised concerns regarding fragile soils, sedimentation, and the crossing of Cantling Creek in that particular reach.

In addition, a southern access route that would have traveled around the south side of West Gibraltar Peak was proposed. This proposed route would have added approximately 4 miles of new road in the unit with approximately 1.3 miles of the new road in “preliminary priority habitat” (PPH) for sage-grouse. Although this alternative disturbed less sage-grouse habitat, there were many other resource concerns, primarily fragile soils that have the potential to slump on slopes.

Both of the above routes were dismissed in favor of analyzing the route described in the proposed action, which crosses the middle of the unit. This decision was based on several resource factors including overall surface disturbance, fragile soils, and wildlife habitats.

2.3.2 Alternative Well Site Locations

The proponent proposed site of Cantling Cr. Well #27-4 raised the same concerns regarding greater sage-grouse and fragile soil.

The proponent next proposed the alternative FRU Stull Well #28-1, which only partially mitigated the resource concerns associated with greater sage-grouse and fragile soils.

The proponent proposed the FRU Federal Well #4-16, which was sited in an area with steep slopes and surface expressions of groundwater in the forms of seeps and slumps. The proposed location was re-sited, named FRU Federal Well #4-14, and is analyzed in this EA as a part of the proposed action.

The proponent proposed the FRU Federal #1-1 to the northeast of a greater sage-grouse lek complex. The APD for this well has been deferred pending guidance from the BLM NWCO Greater Sage-Grouse EIS which is anticipated to be approved in late 2014.

CHAPTER 3 – AFFECTED ENVIRONMENT AND EFFECTS

3.1 INTRODUCTION

Affected Resources:

The CEQ Regulations state that NEPA documents “must concentrate on the issues that are truly significant to the action in question, rather than amassing needless detail” (40 CFR 1500.1(b)). While many issues may arise during scoping, not all of the issues raised warrant analysis in an environmental assessment (EA). Issues will be analyzed if: 1) an analysis of the issue is necessary to make a reasoned choice between alternatives, or 2) if the issue is associated with a significant direct, indirect, or cumulative impact, or where analysis is necessary to determine the significance of the impacts. Table 3 lists the resources considered and the determination as to whether they require additional analysis.

Table 3. Resources and Determination of Need for Further Analysis

Determination ¹	Resource	Rationale for Determination
Physical Resources		
PI	Air Quality	See Chapter 3 for detailed analysis.
NP	Floodplains	There are no FEMA-identified 100 year floodplains identified within the project area.
PI	Hydrology, Ground	See Chapter 3, Water Quality, Ground for detailed analysis.
PI	Hydrology, Surface	See Water Quality, Surface for detailed analysis.
PI	Minerals, Fluid	See Chapter 3 for detailed analysis.
NI	Minerals, Solid	There are no authorized solid mineral permits within the proposed area.
PI	Soils	See Chapter 3 for detailed analysis.
PI	Water Quality, Ground	See Chapter 3 for detailed analysis.
PI	Water Quality, Surface	See Chapter 3 for detailed analysis.

Determination ¹	Resource	Rationale for Determination
Biological Resources		
PI	Invasive, Non-native Species	See Chapter 3 for detailed analysis.
PI	Migratory Birds	See Chapter 3 for detailed analysis.
PI	Special Status Animal Species	See Chapter 3 for detailed analysis.
NP	Special Status Plant Species	There are no federally listed threatened, endangered, or BLM sensitive plant species populations identified within the vicinity of the proposed project area.
PI	Upland Vegetation	See Chapter 3 for detailed analysis.
PI	Wetlands and Riparian Zones	See Chapter 3 for detailed analysis.
NP	Wildlife, Aquatic	There are no aquatic wildlife resources located near any of the four proposed well pads or the proposed access roads.
PI	Wildlife, Terrestrial	See Chapter 3 for detailed analysis.
NP	Wild Horses	The proposed project area is not within a Herd Management Area (HMA).
Heritage Resources and the Human Environment		
NI	Cultural Resources	The proposed well pads and access roads were subject to Class III cultural resource inventories. No historic properties were identified within the current Area of Potential Effects (APE). The proposed undertaking may proceed with a project effect determination of “no historic properties affected.”
NP	Environmental Justice	According to the most recent Census Bureau statistics (2000), there are no minority or low income populations within or near the proposed project area.
PI	Hazardous or Solid Wastes	See Chapter 3 for detailed analysis.
NI	Lands with Wilderness Characteristics	Subject to WO-IM 2011-154 and in accordance with BLM policy, the proposed project area met the criteria of an area greater than 5,000 acres. However the impairment of wilderness characteristics is appropriate and consistent with applicable requirements of law and other resource management considerations due to active subsurface rights.
NP	Native American Religious Concerns	There are no known items, sites, or landscapes determined as culturally significant to the tribes within or immediately adjacent to the APE. The proposed action does not prevent access to any known sacred sites, prevent the possession of sacred objects, or interfere with the performance of traditional ceremonies and/or rituals.
	Paleontological Resources	See Chapter 3 for detailed analysis.
NI	Social and Economic Conditions	There would not be any anticipated changes to local social or economic conditions as a result of the proposed action.
NI	Visual Resources	The proposed project is located in a VRM Class III area where moderate change to the characteristic landscape would be allowed as long as the existing characteristics of the landscape are partially retained. Based on seven criteria, the Scenic Quality Rating is C. The Sensitivity Level Rating is Low, where maintenance of visual

Determination ¹	Resource	Rationale for Determination
		quality has low value. The proposed project area falls within the foreground-middleground zone where management activities and proposed projects may be viewed in more detail. No impacts to visual resources would be anticipated.
Resource Uses		
PI	Access and Transportation	See Chapter 3 for detailed analysis.
NI	Fire Management	There would not be any changes to the fire management in the area due to the proposed action.
NI	Forest Management	There would be minimal woody vegetation remove for road and pad construction. Woody material would be lopped and scattered or removed depending on the size of the material and pending approval of the AO.
PI	Livestock Operations	See Chapter 3 for detailed analysis.
NP	Prime and Unique Farmlands	There are no special status farmlands identified within the proposed project area.
NI	Realty Authorizations, Land Tenure	There would not be any substantial impact to existing realty authorizations in the proposed project area.
NI	Recreation	There would not be any significant impacts to recreation.
Special Designations		
NP	Areas of Critical Environmental Concern	The proposed project area does not meet the criteria for protection as an ACEC. The Irish Canyon ACEC is not in the vicinity of the proposed project area and would not be affected by the proposed action(s).
NP	Wilderness Study Areas	The proposed project area is not located within or in the vicinity of WSAs.
NP	Wild and Scenic Rivers	The proposed project area is not located within or in the vicinity of WSRs.

¹ NP = Not present in the area impacted by the proposed action or alternatives. NI = Present, but not affected to a degree that detailed analysis is required. PI = Present with potential for impact analyzed in detail in the EA.

3.2 PHYSICAL RESOURCES

3.2.1 Air Quality and Climate

Affected Environment: Far-field ambient air quality and air quality related values (AQRV) impact assessment were performed to quantify the hypothetical maximum pollutant impacts at Class I areas and a sensitive Class II area within the study area resulting from construction, drilling, and production emissions for the Little Snake RMP. The Class I and sensitive Class II receptor areas analyzed in the far-field modeling included:

- Mount Zirkel Wilderness Area (Class I)
- Eagles Nest Wilderness Area (Class I)
- Flat Tops Wilderness Area (Class I)
- Dinosaur National Monument (federal Class II, Colorado area designated with the same SO₂ increment as federal Class I).

In summary, the modeling results indicate that impacts resulting from the implementation of the LSFO RMP-ROD would not exceed Colorado or National Ambient Air Quality Standards (CAAQS and NAAQS) or PSD (Prevention of Significant Deterioration) increments within the PSD Class I and sensitive PSD Class II areas analyzed. The PSD increment analyses are for informational purposes only and do not constitute a regulatory PSD increment consumption analysis.

Environmental Consequences, Proposed Action: This proposed action falls well within the range of the Reasonable Foreseeable Development (RFD) of 3,031 wells analyzed in the LSFO RMP. Short term, local impacts to air quality from dust would result during and after well pad construction. Drilling operations produce air emissions such as exhaust from diesel engines that power drilling equipment. Air pollutants could include nitrogen oxides, particulates, ozone, volatile organic compounds, fugitive natural gas, and carbon monoxide. Gas flaring reduces the health and safety risks in the vicinity of the well by burning combustible and poisonous gases like methane and hydrogen sulfide.

At a regional scale, atmospheric dust, caused by destabilization of soil as a result of land use changes coupled with drought conditions, is receiving increased attention for its ability to alter alpine environments. Dust covered snow melts faster because it can absorb more solar energy, which affects snowpack conditions and can result in earlier and faster spring runoff events. The Colorado Plateau has been identified as a primary dust source for several recent alpine dust events on the Western Slope of Colorado. Areas of low annual precipitation, little to no vegetation cover, and an available supply of sediment are of primary concern for mitigation of expanding or new sources of dust.

Mitigation:

- Retaining as much vegetative cover as possible during the project and/or reclaiming and covering disturbed areas shortly following excavation should help keep localized dust down during dry periods.
- Reduce source emissions from drilling operations by minimizing the number of well pads using improved drilling technologies, such as horizontal drilling or other similar approaches that may become available during the expected oil and gas development and operation duration. This would result in decreased emissions of Particulate Matter (PM) during the construction of well pads and associated.
- Drill rig engines will meet EPA tiered emission standards requirements reflective of the year they begin operation in the LSFO.

Environmental Consequences, Modified Proposed Action: Impacts to air quality under this alternative are reduced when compared to the Proposed Action.

Environmental Consequences, No Action Alternative: Under the No Action alternative, because no new disturbance, drilling rigs, or truck traffic is anticipated, no impacts to air quality would occur.

Cumulative Impacts, Proposed Action and Modified Proposed Action: There are a limited number of air pollutant emission sources located within the LSFO; there are a few cities and

towns, very limited oil and gas extraction activities, a few coal mines, and two coal-fired power plants. In the past, the Hayden and Craig Power Plants have historically been shown to have a significant impact on visibility at the Mount Zirkel Class I area (Watson et al. 1996). As a result of that study, and a subsequent legal consent decree, the Hayden and Craig Power Plants have installed pollution controls resulting in emission reductions of approximately 14,000 tons/year SO₂ and 7,000 tons/year NO_x for each plant. The analysis in the LSFO RMP projected a maximum increase of 15 and 11 tons/year SO₂ to the region, respectively (approximately 0.2 percent of the total power plants' SO₂ reductions). It also projected an increase NO_x emissions in the study area by 1,066 tons/year (approximately 8 percent of total power plants' SO₂ reductions). Thus, as total SO₂ and NO_x emissions in the LSFO are lowered in the future, cumulative air quality and AQRV impacts are likely to be reduced from historic levels.

Reference: Additional Air Quality Impact Assessment to Support the LSFO Draft RMP and EIS, Moffat, Routt, and Rio Blanco Counties, CO

Cumulative Impacts, No Action: Impacts would be similar to those described for the proposed action alternative.

3.2.2 Water Quality/Ground

Affected Environment: The Little Snake Resource Area is underlain primarily by the Sand Wash (geologic) basin and contains both alluvial (Yampa River) and sedimentary bedrock aquifers (Wasatch-Fort Union, Mesa Verde, Dakota).

Excerpted from Topper et al. 2003

Yampa River Alluvial Aquifer

Unconsolidated alluvial aquifers can be the most highly productive aquifers in an area and are defined as narrow, thin deposits of sand and gravel formed primarily along stream courses, in this case, along the Yampa River and its tributaries. The alluvium in the Yampa River basin typically consists of unconsolidated deposits of clay, silt, sand, and gravel. The saturated thickness of the Yampa River alluvium ranges from 10 to 100 feet. In the tributary valleys, such as along the Williams Fork River, the saturated portion of the alluvium is generally less than 20 feet thick. Alluvium can be thin or absent where the streams cross hard, resistant bedrock such as sandstone, and thick and wide where the streams cross less resistant bedrock such as shale. Recharge of the alluvial aquifer occurs mainly from bank storage during spring runoff, leakage of irrigation ditches and laterals, and underflow from sedimentary rock aquifers. The Browns Park and Fort Union Formations (Tertiary age) discharge to the alluvium where the alluvium overlies these formations. Published water levels in alluvial wells range from 0 (at land surface) to 41 feet below ground surface, averaging about 10 feet. The alluvium is generally a water table aquifer and water levels will fluctuate seasonally with stages in the adjacent surface water courses.

Alluvial groundwater resources in this basin are used for domestic, livestock, and low demand commercial purposes. Yields from alluvial wells in this basin have been reported from five to several hundred gallons per minute, with the highest yields from the Yampa River alluvium near Steamboat Springs, Hayden, and Craig. A close inspection of alluvial wells in the Yampa River

basin indicates that the majority of domestic water supply wells yield of 15 gpm or less. Alluvial ground water in the Yampa River basin is generally a calcium and sodium bicarbonate type when the alluvial material is derived from the erosion of sandstone or granitic rocks. The water is a calcium sulfate type when the alluvium is composed of reworked Fort Union Formation or where the Fort Union discharges into the alluvium. A summary of the hydraulic characteristics and water quality for the Yampa River alluvial aquifers follows:

Table 4.

Yampa River Basin Alluvial Aquifer characteristics	Typically unconsolidated deposits of clay, silt, sand, and gravel
Primary uses	Domestic, agricultural
Water levels	2-150 feet
Well data	90% <140 feet deep mean depth = 63 feet
Yield	5 to 900 gpm 90% <21 gpm mean yield = 21 gpm
Hydraulic Conductivity	1.9 to 28.8 feet/day
Water quality	Potable in most areas. Drinking water standards are exceeded locally for arsenic, iron, manganese, nitrate, selenium, TDS, and sulfate.

Sedimentary Aquifers of the Sand Wash Basin

Sedimentary rocks of Paleozoic, Mesozoic, and Cenozoic age are represented within the Sand Wash Basin. Tertiary-age geologic formations lie at or near the surface throughout most of the basin, and as such the Wasatch-Fort Union aquifer is the uppermost regional aquifer in the Sand Wash Basin. The thickness of Tertiary rocks in the Sand Wash Basin increases from a feather edge at the margins to about 12,000 feet in the center of the basin. The Wasatch-Fort Union aquifer overlies a group of rocks composing the Mesaverde aquifer, and then the Dakota aquifer (lower Cretaceous). Because of the extensive outcrop area of Cretaceous rocks in the Sand Wash Basin, the Mesaverde and Dakota are likely to be the principal aquifers along the southern, southeastern, and eastern margins of the basin. In these areas, the Cretaceous-age target aquifers exist at depths less than 2,000 feet and their outcrop areas are exposed to recharge from precipitation, resulting in good water quality.

The principal regions of groundwater recharge in the Sand Wash Basin are the outcrop areas of each aquifer unit. Groundwater discharge from the basin is thought to be through the alluvium of the Little Snake River. Wells in the valley bottoms, west of the Little Snake River, indicate that water levels in the Wasatch-Fort Union aquifer are at or near land surface. East of the Little Snake, water levels in the Wasatch zone are generally below the land surface by several to 100 feet.

Published water quality data for the Sand Wash Basin are minimal. One study indicates that the total dissolved solids (TDS) in the recharge areas for the Wasatch-Fort Union aquifer are less than 500 mg/L, but concentrations increase down the flow paths. Based on this interpretation, good water quality should exist along the western and eastern margins of the basin, with increasing TDS toward the Little Snake River. In general, the TDS concentration of ground water in the Mesozoic rocks is less than 1,000 mg/L, along the southeastern and eastern part of

the basin where there is good potential for recharge from precipitation. As ground water in these older rocks moves toward the center of the basin, it becomes briny with TDS greater than 35,000 mg/L. A summary of the hydraulic characteristics and water quality for the sedimentary aquifers follows:

Table 5.

Sedimentary Rock Aquifer characteristics	
Primary uses	Mining, Irrigation
Water levels	Wasatch-Fort Union aquifer: 0-100 feet
Well data	90% <500 feet deep mean depth = 245 feet deepest well = 3000 feet
Yield	<1 to 2700 gpm 90% <18 gpm
Hydraulic Conductivity	Wasatch-Fort Union aquifer: 0.02 to 938 ft/day
Water quality	Minimal published data

No permitted domestic water wells are located within a 0.5-mile radius of the proposed project.

Reference: Topper, R., K.L. Spray, W.H. Bellis, J.L. Hamilton, and P.E. Barkmann. 2003. Groundwater Atlas of Colorado. Colorado Geological Survey. 210 pp.
<http://geosurvey.state.co.us/water/GroundwaterAtlas/Pages/GroundwaterAtlasofColorado.aspx>

Environmental Consequences, Proposed Action: There is the potential that fresh to moderately saline groundwater (TDS concentration < 10,000 Parts Per Million [PPM]) is likely to be found during drilling and setting of surface casing. Potential freshwater zones would be anticipated within the Almond and Lewis Shale Formations. Loss of drilling fluids may occur at any time in the drilling process due to changes in porosity or other properties of the rock being drilled through for both the surface casing and the production hole. When this occurs, drilling fluids may be introduced into the surrounding formations which could include freshwater aquifers. If drilling fluids are lost to groundwater aquifers, aquifers may be contaminated by drilling additives. Using bentonite, freshwater and other additives that cannot contaminate groundwater mitigates the loss of drilling fluids that can be common during drilling since the introduction of these substances would not impact the quality of groundwater. The proponent's drilling plan indicates that water with natural gel would be used to drill the Surface/Intermediate casing.

The proponent did not include plans for completion (fracturing) activities, but those plans would be submitted at a later date if a revised completion program is warranted. Hydraulic fracturing is designed to change the producing formations' physical properties by increasing the flow of water and gas around the well bore. Hydraulic fracturing may also introduce chemical additives into the producing formations. Chemical additives used in completion activities would mostly be pumped back out before production.

Impacts to groundwater resources could occur due to failure of well integrity, failed cement, surface spills, and/or the loss of drilling, completion and hydraulic fracturing fluids into groundwater. The severity of potential impact resulting from leaks, spills, and down-hole

water/gas/drilling fluid migration would largely depend on the type, quantity, and proximity of the contaminant to alluvial/colluvial material and joints/fractures in the drilled formations.

Types of chemical additives used in drilling activities may include acids, hydrocarbons, thickening agents, lubricants, and other additives that are proponent and location specific. Concentrations of these additives also vary considerably and are not always known since different mixtures can be used for different purposes in gas development and even in the same well bore. According to COGCC requirements, all chemicals (greater than 500 pounds) used during drilling, completion, and work-over operations, including hydraulic fracturing treatments, will be disclosed in a chemical disclosure form by well site. Also, chemicals and additives used for hydraulic fracturing will be disclosed on the public web site set up for this purpose (<http://fracfocus.org>).

Environmental Consequences, Modified Proposed Action: Impacts to water quality under this alternative are reduced when compared to the Proposed Action.

Environmental Consequences, No Action Alternative: Under this alternative, no development would occur, precluding new groundwater impacts related to drilling, completing, servicing, or producing federal minerals.

Cumulative Impacts, Proposed Action and Modified Proposed Action: Combined with other past, present and reasonably foreseeable future development in the proposed project area, surface disturbance associated with the proposed action would result in incremental increases in soil erosion and potential delivery of water quality contaminants to area groundwater resources. This increase in potential water quality contamination throughout the area could collectively result in decreased water quality over time.

Cumulative Impacts, No Action: Impacts would be similar to those described for the proposed action alternative, but would not include the impacts from the proposed action.

Mitigation Measures: The APD contains a geologic downhole report that requires that the proponent isolate and protect all fresh to moderately saline water (TDS < 10,000 PPM) that is encountered during drilling from communication and contamination with other fluids (see COAs in Appendix A). The proponent would be required to submit a report showing the depth and analysis of all groundwater encountered during drilling. In addition, the proponent has agreed to comply with COGCC's 609 Groundwater Protection Rules.

3.2.3 Minerals/Fluid

Affected Environment: The proposed wells would be in favorability zone 4 (highest for oil and gas potential). These wells would penetrate the Mancos, Niobrara and Frontier Formations.

Environmental Consequences, Proposed Action: The casing and cementing program would be adequate to protect all of the resources identified above. All coal seams and fresh water zones would also be protected by casing and cement. The blowout preventer (BOP) system would be adequately sized.

Environmental Consequences, Modified Proposed Action: The casing and cementing program would be adequate to protect all of the resources identified above. All coal seams and fresh water zones would also be protected by casing and cement. The blowout preventer (BOP) system would be adequately sized.

Environmental Consequences, No Action Alternative: Under the No Action alternative, there would be no development of fluid minerals and no effects on existing fluid mineral reservoirs.

Cumulative Impacts, Proposed Action and Modified Proposed Action: The proposed drilling of this gas wells would further deplete the hydrocarbon resources of the targeted formations.

Cumulative Impacts, No Action: There would be no contribution to the recovery of oil and gas resources.

Mitigation: See COAs in Appendix A.

3.2.4 Soils

Affected Environment: Appendix D is a summary of soil properties relevant to the construction of infrastructure proposed as part of this Proposed Action. Soils within the general project area are expansive due to the relatively high clay content. Erosion, slumping, and structural failure are already evident in the area, which can lead to significant structural engineering and reclamation challenges. As such, elements of fragile soils do occur in the proposed project area (moderate to high K (runoff) Factor, clay surface texture, moderate to severe erosion hazard).

Environmental Consequences, Proposed Action: The proposed action would involve surface disturbance for new or upgraded access roads for four well pads, resulting in approximately 43 acres of short-term vegetation loss and soil compaction and displacement, with a long-term loss of approximately 38 acres. In general, the area that would be affected by the proposed action currently has adequate vegetation buffers and moderate slopes that would reduce the potential for sediment transport to Cantling Creek, a perennial tributary of the Little Snake River. Construction activities would cause mixing of soil horizons, increases in local soil loss, loss of soil productivity, and sediment available for transport to surface waters. Noxious weed infestation resulting from disturbance would impact soil productivity. Potential for such soil loss and transport would increase as a function of slope, feature (pad, road route) to be constructed, and proximity to streams.

Although single-well pads are typically smaller in size than multi-well sites, they result overall in greater soil disturbance since many more pads and access roads are required. Consequently, vehicle trips for well pad services are also greater since wells are spread out, increasing the potential for dust creation, erosion, and soil compaction. Throughout the affected area, the potential would also exist for accidental spills or leaks of petroleum products and hazardous materials during construction, drilling activities and long term operations for the life of the wells.

These events would cause soil contamination and may decrease the soil fertility and revegetation potential.

The following soil/slope characteristics are indicative of a potentially fragile soil or high erosion hazard:

- 1) Soils rated as highly or severely erodible by wind or water, as described in NRCS soil survey reports.
- 2) Soils on slopes >35%, particularly if they have one of the following characteristics: a) a surface texture that is sand, loamy sand, very fine sandy loam, fine sandy loam, silty clay, or clay; b) a depth to bedrock that is < 20 inches; c) an erosion hazard rating of high or very high; and d) a K (soil erodibility potential) factor >0.32.

According to Appendix D, there are many concerns regarding soil stability for construction and maintenance during the operational life of the roads and pads. Soil strength is rated as low across all soil types present, which results in severe soil rutting during heavy equipment use, particularly during wet conditions. Most heavy equipment would be used on existing roads or to create new roads or pads. A rating of “moderate” to “severe” for construction limitations for haul roads indicates that there are one or more physical limitations of soils present that can make construction very difficult or very costly. Significant water runoff that can result in erosion is expected in these soils, requiring frequent maintenance of roads and as well as (potentially) costly erosion-control measures. Many proposed facility locations are rated as “poorly suited” for site preparation.

Much of the proposed infrastructure occurs on or crosses areas of high clay content (40%-54%); the soil surface textures of most soil groups contain clay. Clay soils are expansive, capable of large volume changes with changes in precipitation regimes. This shrink-swell action can lead to subsidence, cracking, sliding, and infrastructure failure. Undisturbed, these soils typically would remain relatively stable, experiencing slow movement over time. Once disturbed, erosion, heavy precipitation, and cut and fill slopes can activate or accelerate failures.

Fragile soils are likely to occur along the portion of the proposed bypass road that parallels an intermittent drainage, leading to FRU Federal 11-14. Problems with fragile soils are compounded when they occur close to surface water sources, as is the case here with a reach of Cantling Creek Headwater. Furthermore, the proposed pad location for FRU Federal 11-4 is sited approximately 65 linear feet from this same drainage and the proposed road to the pad crosses an unnamed lentic drainage. When eroded sediments flow directly into stream channels, subsequent increases in sediment and salinity can be dramatic. Increases in salt and sediment can make water unsuitable for beneficial uses, such as irrigation and livestock/wildlife water sources.

Although reviewed by a BLM engineer for compliance with road construction guidelines outlined in The Gold Book, construction of the proposed facilities based solely in accordance with The Gold Book is not likely to be adequate in the prevention of erosion, slumping, and structural failure, as is already evident in the area. Engineered design for construction oversight in areas of slope instability and severe erosion would be required.

Environmental Consequences, Modified Proposed Action: With the elimination of two pad sites, access roads, and most of the proposed bypass road, total surface disturbance and the associated impacts described above would be reduced from 61.3 to 26.7 acres. More importantly, disturbance across fragile soils is greatly reduced, particularly with the elimination of FRU Federal 11-14 and its access road that crosses some of the more sensitive soils within the entire proposed project area. Overall, the Modified Proposed Action would result in reduced impacts when compared to the Proposed Action.

Environmental Consequences, No Action Alternative: Under this alternative, the Federal APDs would not be approved and new/upgraded roads servicing the proposed pads would not be constructed. Therefore, any negative impacts related to construction, drilling, or completions would be eliminated.

Cumulative Impacts, Proposed Action and Modified Proposed Action: Environmental Consequences, Cumulative Impacts: Past, present, and reasonably foreseeable actions that affect soils in the upper Little Snake River valley primarily include ranching, some fluid mineral exploration and development, and the infrastructural development necessary to support these two activities. The majority of livestock grazing impacts occur around existing water sources such as streams, springs, troughs, stock ponds, areas providing cover or shade, and along fence lines where livestock tend to trail. The soils within and closely surrounding these areas receive heightened use and may exhibit signs of soil compaction, erosion, and reduced productivity.

Oil and gas activities occur in the valley in a limited amount on both private and public lands. Development of subsurface minerals includes the removal of top soil and exposure of subsurface soils. These areas of decreased vegetation and litter cover are generally more susceptible to soil erosion, increased runoff, and infestation by invasive, non-native plant species. Some restoration work has occurred at the pad sites to limit the amount of soil erosion, but bare soil still remains in places. Development on public lands always includes mitigation measures to reduce or eliminate these impacts; however, development on private land may not be as closely monitored or mitigated.

The primary impact to soils from infrastructural development has been disturbance, spread of invasive species, runoff and off-site sedimentation associated with road construction, maintenance, and use. The nature and extent of the impact varies with the type of road, the extent of use, the level of maintenance, and soil characteristics (see Affected Environment). For example, primitive 4WD roads, and ATV trails are naturally surfaced and rarely used or maintained, making them susceptible to potentially severe gullying and rilling, especially on grades. Naturally surfaced and gravel-surfaced roads also occur in the valley. Although the extent of use and level of maintenance varies, these roads typically are used more often and receive a higher level of maintenance than primitive roads and trails. Because these types of roads are often used for fluid mineral activities, most have engineered designs and culverts to drain runoff. As a consequence, these roads are less likely to erode, though runoff and off-site sedimentation still occur.

Cumulative Impacts, No Action: Past, present, and reasonably foreseeable actions that affect soil health and stability in the upper Little Snake River Valley is the same as described in the Proposed Action. Under this alternative, the potential impacts to soils caused by ranching would

remain the same. However, there would not be the additional surface disturbance caused by new road and pad construction (or upgrades/ maintenance of existing infrastructure) that could accelerate erosion, increase soil instability and structural failures, and facilitate the spread of noxious weeds.

Mitigation: In addition to the recommendations found in the BLM Engineering Review, a review of the applicant's proposed development and infrastructure plans conducted by a licensed BLM engineer for compliance with BLM surface operating standards and guidelines, the following should be considered for the purpose of minimizing the risk of sedimentation, spills, and other contaminants reaching intermittent/ephemeral streams to protect water quality, stream function, and aquatic habitat:

- No surface occupancy (NSO) of 50 horizontal feet as measured from the top of the stream bank for all intermittent or ephemeral streams/drainages.
- Controlled surface use (CSU) from the edge of the NSO buffer up to 100 feet for all intermittent or ephemeral streams/drainages. Minimize locating roads, stream crossings and facilities within this zone. Adequate professional design and engineering of activities within this zone is necessary to prevent stormwater runoff and sedimentation.

For the purpose of minimizing soil compaction and erosion:

- When saturated soil conditions exist on or along the right-of-way, construction shall be halted until soil material dries out sufficiently for construction to proceed without undue damage and erosion to the right-of way.
- The proponent shall provide satisfactory reclamation of all sites disturbed by their activity. This would include installation of additional erosion control devices and seeding at the discretion of the BLM AO.
- Topsoil shall be conserved during excavation and reused as cover on disturbed areas to facilitate re-growth of vegetation. Topsoil shall only be used for reclamation and shall not be used to bed or pad the pipe during backfilling.
- Cuts and fills shall be minimized when working on erosive soils and slopes in excess of 30%. Cut-and-fill slopes shall be stabilized through revegetation practices with an approved seed mix shortly following construction activities to minimize the potential for slope failures and excessive erosion. Fill slopes adjacent to drainages shall be protected with well-anchored silt fences, straw wattles, or other acceptable BMPs designed to minimize the potential for sediment transport. On slopes greater than 50%, BLM personnel will request a professional geotechnical analysis prior to construction.
- To control erosion and sediment transport, roads shall be crowned or sloped, ditched, surfaced, drained with culverts and/or water dips, and constructed to BLM Gold Book standards, or to engineered design if fragile soil properties exist. Culvert outlets shall incorporate controls such as rip-rap, sediment catchments, and anchored straw bales,

to slow water velocity and prevent erosion and soil transport. Initial gravel application shall be a minimum of 6”.

- All erosion and sediment control practices and measures shall be constructed, applied, and maintained in accordance with an approved erosion and sediment control plan.
- The proponent/holder shall provide timely year-round road maintenance and cleanup on roads. A regular schedule for maintenance shall include, but not be limited to, crown or slope reconstruction, blading, ditch, culvert and catchment cleaning, road surface replacement, and dust abatement. When rutting within the traveled way becomes greater than three inches, blading, and/or gravelling shall be conducted as approved by the BLM AO. All road construction activities shall be supported with a fully implemented stormwater management plan (see Attachment C), best management practices and a reclamation/vegetation plan.
- Topsoil shall be windrowed around the pad perimeter to create a berm that limits and redirects stormwater runoff and extends the viability of the topsoil. Topsoil shall also be windrowed, segregated, and stored along roads for later spreading across the disturbed corridor during final reclamation. Topsoil berms shall be promptly seeded to maintain soil microbial activity, reduce erosion, and minimize weed establishment.
- Top soil segregation would not occur when soils are saturated or frozen unless special authorization is granted by the BLM AO.
- Should activities extend into winter months, prior to December 1, a Winter Construction Plan would be submitted and approved by the BLM AO before a Notice to Proceed would be authorized for construction activities in frozen soils.
- Topsoil stripping shall be confined to the immediate construction areas. A 4 to 6-inch stripping depth is common, but depth may vary depending on the particular soil. All perimeter dikes, basins, and other sediment controls shall be in place prior to stripping.
- Topsoil shall not be placed while in a frozen or muddy condition, when the subgrade is excessively wet, or in a condition that may otherwise be detrimental to proper grading or proposed sodding or seeding.
- Mulch shall be applied within 24 hours following completion of seeding. Mulch may consist of either hydromulch or of certified weed-free straw or certified weed-free native grass hay crimped into the soil. NOTE: Mulch is not required in areas where erosion potential mandates use of a biodegradable erosion-control blanket (straw matting).
- Cut-and-fill slopes shall be protected against erosion with the use of water bars, lateral furrows, or other measures approved by the BLM. Cut-and-fill slopes along drainages or in areas with high erosion potential shall also be protected from erosion using hydromulch designed specifically for erosion control or biodegradable

blankets/matting, bales, or wattles of weed-free straw or weed-free native grass hay. A well-anchored fabric silt fence shall also be placed at the toe of cut-and-fill slopes along drainages or to protect other sensitive areas from deposition of soils eroded off the slopes. Additional BMPs shall be employed as necessary to reduce soil erosion and offsite transport of sediments.

- Prior to commencing any surface disturbing activities, a qualified geotechnical engineer licensed in the State of Colorado shall prepare a site evaluation and analysis in at risk areas showing evidence of slope instability (e.g., past mass movement or slumping soils, high soil moisture content present in undisturbed soils, presence of springs or seeps), for cut and fill slopes in excess of 30 feet in height, and cut of fill slope angles steeper than the requirements in the BLM Gold Book 2007 (3:1 in erosive soil, 1:1 common soils, 0.5:1 conglomerate, 0.25:1 solid rock) as determined by the BLM.
- During the construction of the pad/and or road sections in areas at risk of slope instability or environmentally sensitive areas a qualified independent construction inspector or civil/geotechnical engineer shall be onsite during all phases of construction in the at risk areas and as determined by the BLM. The inspector/engineer shall confirm the pad and/or road sections are built to specification in the design package includes, but not limited to cut and full slope staking, disturbance limits staking, excavation and embankment placement, slope compaction, slope retention devices, slope benching, at grade and subgrade drainages stormwater control measures etc. Inspection reports prepared by the construction inspector or onsite engineer would be submitted to the BLM AO.

3.2.5 Water Quality/Surface

Affected Environment: Any surface runoff from the proposed four federal wells and bypass road would flow into tributaries of Cantling Creek, a perennial tributary of the Little Snake River. Water quality for all tributaries of the Little Snake River (from its first crossing of the Colorado/Wyoming border to a point immediately below the confluence with Fourmile Creek) must support a wide variety of cold water biota, including sensitive species (classification: Aquatic Life Cold 1), primary contact recreational uses (classification: Recreation P), and agricultural uses, including crop irrigation and livestock drinking water (classification: Agriculture). There are no water quality impairments or suspected water quality issues for waters influenced by the project area considered in the proposed action.

Environmental Consequences, Proposed Action: Surface waters adjacent to or influenced by the proposed project areas are currently supporting the classified uses described above. The Proposed Action would result in approximately 61 acres of initial surface disturbance or upgrades for pad and road construction. Following interim reclamation, the long term disturbance would be approximately 39 acres of access roads and pad area that are required to be in service for the life of the wells. Potential impacts to surface water associated with the Proposed Action would occur from surface-disturbing activities, traffic, waste management, and the use, storage and transportation of fluids (i.e., chemicals, condensate, and produced

water). Surface-disturbing activities associated with the wells and associated infrastructure would cause loss of vegetation cover, soil compaction and displacement, increased volume and velocity of runoff, and increased sedimentation in surface waters. Initially, impacts could be minimized by stormwater management, stockpiling topsoil, controlling erosion, and accelerated rehabilitation of disturbed surfaces. Long term soil protection could be achieved by continued road and pad maintenance to reduce erosion, remediation of contaminated soils and minimizing the size of the long-term pad footprint through interim reclamation measures. These measures would include limiting cut slope steepness, stepcutting, crowning road surfaces, installing culverts and drainage systems, and applying gravel to all upgraded BLM-managed roads in the proposed project area to the recommended compacted thickness.

Oil and gas waste management practices have the potential to contaminate soils and surface water. Contamination of soils could cause long-term reduction in site productivity resulting in increased erosion and potential sediment and contaminant delivery to nearby drainages, namely the Cantling Creek headwaters during runoff. Use, storage, and transportation of fluids such as produced water and condensate have the possibility of spills that could migrate to surface or groundwater. Tanks used to store produced water and condensate would be placed in secondary containment to prevent offsite release. Other elements of the Proposed Action are designed to mitigate risks to surface waters associated with the release of drilling fluids, produced water, and condensate. A closed-loop drilling system would be implemented. In this process, drilling fluids are recycled, and cuttings are dried through the use of a shaker system, remediated, and stacked against the cutslope on the pad or hauled offsite. A traditional reserve pit would not be constructed. Cuttings management areas must be decontaminated to COGCC standards prior to pit closure. Implementation of the standard COAs for mitigating impacts to surface waters would minimize risks of adverse impacts associated with construction and ongoing production activities.

Environmental Consequences, Modified Proposed Action: With the elimination of two of the four proposed sites, impacts to water quality as described above would also be reduced. This is particularly true with the elimination of FRU Federal 11-14, as the potential for increased sedimentation to perennial surface waters would be reduced since the bypass road leading to this proposed site that crosses Cantling Creek would not be constructed. Impacts to surface water quality under this alternative are reduced when compared to the Proposed Action.

Environmental Consequences, No Action Alternative: Under this alternative, the Federal APDs would not be approved, and new/upgraded roads and proposed pads would not be constructed. Therefore, any negative impacts to surface water quality as related to construction, drilling, or completions would be eliminated.

Cumulative Impacts, Proposed Action and Modified Proposed Action: Past, present, and reasonably foreseeable actions that affect surface water quality in the upper Little Snake River Valley primarily includes ranching, limited fluid mineral exploration and development, and the infrastructural development necessary to support these two activities.

The upper Little Snake River watershed is that area which drains water to the point where several perennial streams (Slater Creek, Cantling Creek, and Fly Creek) flow into the Little

Snake River along the Colorado and Wyoming border near the town of Baggs, WY. Pollutants that are delivered downstream typically include pathogens, nutrients, and some sediment. Of all the perennial waters within this watershed, Slater Creek (including tributaries from its source to Second Creek) is on the State of Colorado's Monitoring and Evaluation list for suspected water quality problems involving *E. coli*, selenium, and total recoverable iron. Further upstream of the proposed project area, the Little Snake River (including all tributaries and wetlands from the U.S. Forest Service boundary to the Wyoming border) is also on the same list for a suspected copper problem. Grazing occurs at some level in nearly every portion of the watershed. During snow melt driven high-flow events that occur in the late spring, some sediment is delivered to the upper Little Snake River from its numerous tributaries. This sediment flush is a natural occurrence; the amount of sediment occurring above background levels as a result of grazing across the watershed is not known.

The effect to water quality due to fluid mineral and infrastructural development is primarily sedimentation, a result of the construction, improvement, and maintenance of roads and pads adjacent to riparian areas in the watershed. The portion of sediment that is delivered to the Little Snake River as a direct consequence of these improvements is not known, but is likely to occur during the spring high flow period coincident with the natural sediment discharge peak as well as summer storm events.

Treatment of invasive species within riparian corridors for any of the above land uses would have likely introduced chemicals into streams, but in small amounts relative to the watershed, and dilution and dispersal in these effects may not be detectable in water that is discharged to the Little Snake River.

Reference: Colorado Department of Public Health and Environment Water Quality Control Commission. 2012. Regulations #33, 37, and 93. <http://www.cdphe.state.co.us/regulations/wqccregs/index.html>

Cumulative Impacts, No Action: Past, present, and reasonably foreseeable actions that affect surface water quality in the upper Little Snake River Valley is the same as described in the proposed action. Under this alternative, the potential impacts to surface water quality caused by ranching would remain the same. However, there would not be the additional surface disturbance caused by new road and pad construction (or upgrades/ maintenance of existing infrastructure) that could lead to an unnatural increase in sedimentation to perennial surface waters over the long term.

Mitigation:

The following should be considered for the purpose of minimize the risk of sedimentation, spills, and other contaminants reaching intermittent/ephemeral streams to protect water quality, stream function, and aquatic habitat:

- No surface occupancy (NSO) of 50 horizontal feet as measured from the top of the stream bank for all intermittent or ephemeral streams/drainages.
- Controlled surface use from the edge of the NSO buffer up to 100 feet for all intermittent or ephemeral streams/drainages. Minimize locating roads, stream

crossings and facilities within this zone. Adequate professional design and engineering of activities within this zone is necessary to prevent stormwater runoff and sedimentation.

- Cut-and-fill slopes shall be protected against erosion with the use of water bars, lateral furrows, or other measures approved by the BLM. Cut-and-fill slopes along drainages or in areas with high erosion potential shall also be protected from erosion using hydromulch designed specifically for erosion control or biodegradable blankets/matting, bales, or wattles of weed-free straw or weed-free native grass hay. A well-anchored fabric silt fence shall also be placed at the toe of cut-and-fill slopes along drainages or to protect other sensitive areas from deposition of soils eroded off the slopes. Additional BMPs shall be employed as necessary to reduce soil erosion and offsite transport of sediments.
- Construction activities at perennial, intermittent, and ephemeral drainage crossings (e.g. burying pipelines, installing culverts) shall be timed to avoid high flow conditions. Construction that disturbs any flowing stream shall utilize either a piped stream diversion or a cofferdam and pump to divert flow around the disturbed area.
- Culverts at drainage crossings shall be designed and installed to pass a 25-year or greater storm event. On perennial and intermittent streams, culverts shall be designed to allow for passage of aquatic biota. The minimum culvert diameter in any installation for a drainage crossing shall be 24 inches. Crossings of drainages deemed to be jurisdictional waters of the U.S. pursuant to Section 404 of the Clean Water Act may require additional culvert design capacity.

3.3 BIOLOGICAL RESOURCES

3.3.1 Invasive/Non-Native Species

Affected Environment: Invasive and noxious weeds are present in the proposed project area. Invasive annuals such as downy brome (cheatgrass), halogeton, blue mustard and yellow alyssum are common, occupying disturbed areas. Invasive annual weeds are typically established on disturbed and high traffic areas whereas biennial and perennial noxious weeds are less common in occurrence. Perennial noxious weeds that are present within the surrounding areas include Russian knapweed, hoary cress (whitetop), Canada thistle, musk thistle, bull thistle, Scotch thistle and other biennial thistles. The BLM works with the Moffat County Cooperative Weed Management program to employ the principals of Integrated Pest Management to control noxious weeds on public lands within the proposed project area.

Environmental Consequences, Proposed Action: The surface disturbing activities and associated traffic involved with construction of these well sites, access roads and support infrastructure and subsequent activities would create an environment and provide a mode of transport for invasive species and other noxious weeds to become established. Construction equipment and any other vehicles brought onto the sites could introduce weed species. Wind, water, recreational vehicles,

livestock and wildlife would also assist with the distribution of weed seed into the newly disturbed areas. The annual invasive weed species (downy brome, yellow alyssum, blue mustard and other annual weeds) occur on adjacent areas and would occupy the disturbed areas. The bare soils and the lack of competition from a perennial plant community would allow these weed species to grow and could affect the establishment of seeded plant species. Establishment of perennial grasses and other seeded plants is expected to provide the necessary control of invasive annual weeds within 2 or 3 years. Additional seeding treatments of the disturbed areas may be required in subsequent years if initial seeding efforts are not successful.

The perennial and biennial noxious weeds in the area are less frequently established on the uplands but some potential exists for their establishment in draws and swales or areas that would collect additional water. The largest concern in the project area would be for these species to become established and not be detected, providing seed which can be moved onto adjacent rangelands. The proponent would be required to control any invasive and/or noxious weeds that become established within the disturbed areas involved with drilling and operating a well. Prior to applying herbicides on BLM-managed lands the proponent must obtain an approved Pesticide Use Proposal (PUP).

Mitigation: Mitigation attached as COAs to minimize disturbance and obtain successful reclamation of the disturbed areas, as well as weed control utilizing integrated practices, including herbicide applications, would help to control the noxious weed species. All principles of Integrated Pest Management should be employed to control noxious and invasive weeds on public lands.

Environmental Consequences, Modified Proposed Action: The potential for invasive plants under this alternative are reduced when compared to the Proposed Action.

Environmental Consequences, No Action Alternative: Under the No Action alternative, because no disturbance is anticipated, no additional effects to the spread of invasive weeds would occur.

Cumulative Impacts, Proposed Action and Modified Proposed Action: The proposed action would not add substantially to existing or proposed disturbances in the area. There are currently populations of noxious weeds in newer disturbances, as well as historic and opportunistic populations in the larger landscape. If these invasive species are treated as COAs require, populations should be kept in check or even eradicated through timely pesticide application and reclamation procedures.

Cumulative Impacts, No Action: Under this alternative, the potential impacts to invasive plant species caused by ranching would remain the same. However, there would not be the additional surface disturbance caused by new road and pad construction (or upgrades/ maintenance of existing infrastructure) that could lead to an increase in invasive plant populations.

3.3.2 Migratory Birds

Affected Environment: BLM guidance emphasizes management of migratory bird habitat for species of conservation concern by avoiding or minimizing negative impacts and restoring and enhancing habitat quality. The LSFO provides both foraging and nesting habitat for a variety of migratory bird species. Several species on the USFWS's Birds of Conservation Concern (BCC) List occupy these habitats within the LSFO.

The proposed project area would be located in the Northern Rockies and Southern Rockies/Colorado Plateau Bird Conservation Regions. Native plant communities in the area are comprised primarily of sagebrush stands with an understory of grasses and forbs and mountain shrublands. In addition, scattered aspen and mixed coniferous woodlands can be found within the GAP. A variety of migratory birds may utilize these vegetation communities during the nesting period (May through July) or during spring and fall migrations. Those species associated with the Northern Rockies and Southern Rockies/Colorado Plateau regions that potentially occur in the project area are presented by habitat affiliation below.

BCC species associated with shrubland habitats in the GAP include: Brewer's sparrow, sage sparrow, sage thrasher and loggerhead shrike. Brewer's sparrows, sage sparrows and sage thrashers are summer residents in Colorado and nest in sagebrush stands. These species would likely be nesting in the project area from mid-May through mid-July. Loggerhead shrikes utilize more open habitats with scattered shrubs or trees. This species would also be within the GAP area in the summer months.

BCC species that utilize mixed conifer and aspen stands include Cassin's finch and flammulated owl. Cassin's finch is a year round resident of Colorado. This species nests in higher elevation forests and moves to lower elevations for the winter. Flammulated owls nest in tree cavities and inhabit higher elevation aspen and conifer forests during the summer months.

Raptor species are tied to several different habitat types within the LSFO. Sagebrush and other shrublands provide open spaces for hunting, while rocky outcrops, woodlands, sporadic trees and cottonwood forests provide nesting substrates. There are several golden eagle and prairie falcon nests within the GAP area. There are no bald eagle nests or roosts within the GAP, but this species uses the general area for winter habitat. Bald eagles opportunistically forage on winter killed big game species in the winter months.

In addition, there are several known sandhill crane nesting and staging areas within the boundaries of the GAP.

More generally, birds associated with the GAP are well distributed in extensive suitable habitats throughout the LSFO and northwest Colorado and habitat-specific bird assemblages appear to be composed and distributed appropriately to the normal range of habitat variability.

Environmental Consequences, Proposed Action: The proposed action would result in the direct removal of approximately 43 acres of migratory bird habitat. Approximately 20 acres of the surface disturbance would be linear, creating more edge habitats and fragmenting large areas of

sagebrush and mountain shrublands. Birds that utilize edge habitats may benefit from this disturbance, while habitat quality for birds that need larger areas of intact habitat would be reduced. Following natural succession regimes, sagebrush communities would take 20-30 years to return to preconstruction conditions following reclamation. Removal of sagebrush would be minimal on a landscape level, but this disturbance would decrease patch size and may degrade habitat for migratory birds on a small scale. Indirectly, habitat effectiveness adjacent to well pads would be reduced as a result of noise and human activity during construction, drilling and completion activities.

If the wells are successful, some of these impacts would continue during routine maintenance and operations of the wells. Inglefinger and Anderson (2004) documented 40-60% declines in Brewer's sparrow abundance within 100 meters of well access roads in Wyoming, and it is likely that this effect would be similar within the LSFO. Indirect habitat loss attributable to this behavioral response adds substantially to the effects of habitat loss due to long term facility occupation and sagebrush modification. Golden eagles and other raptors would likely avoid the well sites during the drilling and completion phase, but may begin to hunt in the general area after well completion. Since there are no raptor nests in close proximity to the new road or any of the four proposed well sites, impacts to nesting and breeding activities are not expected.

It is unlikely that the proposed action would be conducted during the winter months in bald eagle winter habitat due to a big game crucial winter timing limitation overlap. Construction and drilling would have no impacts to bald eagles if conducted outside of the winter months. If the wells are successful, there may be increased carrion available to bald eagles because of an increase in traffic and possible big game/vehicle mortalities. An increase in carrion near highways may pose a risk to bald eagles because they may be struck and killed by vehicles.

If drilling activities occur during the nesting season, there could be negative impacts to migratory bird species through nest destruction or increased stress leading to nest abandonment. Timing limitations to protect greater sage-grouse and Columbian sharp-tailed grouse (see Special Status Animals Section) would cover most of the migratory bird nesting season, so the risk for these impacts would be low. Although the Proposed Action would have some impacts to migratory bird species, these impacts would be highly localized and would not be expected to negatively affect migratory birds on a landscape level.

Mitigation: None.

Environmental Consequences, Modified Proposed Action: Impacts to migratory birds and their habitat would be reduced from this alternative when compared to the Proposed Action. Direct removal of vegetation would be reduced from 61 acres to 27 acres and linear disturbance would be reduced from ~8.25 miles to ~5.3 miles. Since there would be a reduction in linear disturbances, habitat fragmentation would also be reduced, with habitat patch size remaining intact in areas where development does not occur. The Proposed Action would permit four new wells and access to two existing wells. The Modified Proposed Action would permit two new wells and access to one existing well. This would reduce disruption impacts from noise associated with drilling and would reduce the amount of traffic associated with drilling and well

maintenance. Overall, the Modified Proposed Action would result in reduced impacts when compared to the Proposed Action.

Mitigation: None.

Environmental Consequences, No Action Alternative: There would be no impacts to migratory birds or their habitat from the No Action Alternative.

Cumulative Impacts, Proposed Action and Modified Proposed Action: Past, current and future activities occurring in the area include livestock grazing and management, limited oil and gas development and recreation, primarily hunting. The Proposed Action represents an incremental increase in disturbances that may impact the availability and utility of migratory bird habitat in combination with other activities occurring in the area. Species which require large blocks of habitat would be more affected by disturbance than species that utilize edge habitats. The removal of approximately 61/27 acres of sagebrush would not have a measureable influence on local bird populations as there is considerable suitable habitat adjacent to the project area, however, continued noise from traffic may reduce the quality of this habitat. Prompt and effective reclamation would promote a healthier, diverse plant community which would benefit local wildlife populations as a whole.

Cumulative Impacts, No Action: There would be no contribution to previous or existing disturbances that would potentially impact migratory bird species or habitats under the No Action Alternative.

3.3.3 Special Status Animals

Affected Environment: There are no ESA listed or proposed species that inhabit or derive important benefit from the proposed project area. Critical habitat for the razorback sucker, Colorado pikeminnow, bonytail and humpback chub (Colorado River Fish) is located downstream of the proposed project area. Any impact to Colorado River Fish from the Proposed Action would be in the form of water depletion.

Several BLM-sensitive animal species are known to inhabit or may be indirectly influenced by the Proposed Action, including greater sage-grouse, Columbian sharp-tailed grouse, bald eagle and Brewer's sparrow.

Greater sage-grouse

In March of 2010, the USFWS concluded that greater sage-grouse warranted protection under the ESA; however, the USFWS determined that proposing the species for protection is precluded by the need to take action on other species facing more immediate and severe extinction threats. As a result, greater sage-grouse are considered a candidate species for ESA protection. Habitat loss and fragmentation resulting from wildfire, energy development, urbanization, agricultural conversion, conversion of sagebrush to other vegetation types (such as pinyon-juniper woodlands) and infrastructure development are the primary threats to the species (USFWS 2010).

The project is located in NW Colorado's sage-grouse management Zone 4a. In this zone, 13 leks are identified. Eight of these leks are currently considered active with a three year average lek count of 118 males within the zone. Lek counts have fluctuated, but in general, the leks within the GAP have decreased over the last 10 years, except for the Fan Rock lek, which has increased every year for the last 5 years. Greater sage-grouse utilize sagebrush ecosystems within the FRU for breeding, nesting and brood-rearing. Approximately 22,000 acres of the unit, or just over half of the entire unit is mapped as Preliminary Priority Habitat (PPH) by Colorado Parks and Wildlife (CPW). PPH is defined as areas that have been identified as having the highest conservation value to maintaining sustainable greater sage-grouse populations.

Sage-grouse are considered a sagebrush ecosystem obligate species. Sagebrush provides nesting, brooding, and fall and winter cover, as well as forage throughout the year. Each year, male sage-grouse congregate in late winter through spring on leks to display their breeding plumage and to attract hens for mating. Typically, leks are positioned within proximity of nesting and brood-rearing habitat; therefore, they are often considered an excellent reference point for monitoring and habitat protection measures. Nesting habitat is primarily characterized by sagebrush communities that have 15% to 30% canopy cover, and a grass and forb understory. Residual cover of grasses is also important for nesting cover. Most nesting occurs within 4 miles of leks (Colorado Greater Sage-grouse Steering Committee 2008).

There are six active leks within the FRU. Distance from the four proposed wells and closest access road (proposed or existing) to each active lek can be found in the table below. The four W. Gibraltar leks will be referred to as the "Gibraltar Lek Complex" in this document. During onsite inspections conducted in 2010, 2011 and 2012, vegetative communities in the FRU were found to be in good condition, providing suitable nesting and brood rearing habitat for greater sage-grouse.

Table 6. Recent lek counts in the Focus Ranch Unit.

Lek Name	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Squaw Mountain	--	--	--	--	--	10	9	6	4	6
W. Gibraltar 1	16	51	37	41	NC	27	30	2	17	36
W. Gibraltar 2		17	0	0	NC	0	0	9	0	0
W. Gibraltar 3	158	165	120	101	NC	74	25	26	25	35
W. Gibraltar 4					NC	0	NC	0	0	9
Three Forks					NC	NC	0	3	0	0

*NC = Not Counted

The original access road to the Focus Ranch Federal Well 12-1 was constructed in 2005. This road was 11 miles long and disturbed approximately 67 linear acres. Approximately 50% of this road was new construction and 50% was an upgrade to existing two-tracks in the area. The 12-1

well and the access road represented the first intrusion of oil and gas exploration into this sage-grouse habitat since three other wells were drilled and abandoned in the '70s and '80s. The largest lek in the unit, the West Gibraltar #3, had a high male count of 158 males when it was discovered in a BLM required survey in 2004. This lek is located 0.92 mile from the 12-1 well site and 0.65 mile from the road (at the closest point). In 2005 this lek had a high count of 165 males. In the spring of 2006, after the road and well pad were constructed, the lek count was 120 males. In the spring of 2007, after the well was drilled, the lek count was 101 males. The numbers on the lek again declined in 2009 to 74 males. This was following a record high snow in the winter of 2008. The lek had remained constant at about 25 males for three years (2010 – 2012), however, the count increased to 35 males in 2013.

The three existing wells in the unit (Federal 3-1, Federal 12-1 and Butter Lake 32-10) are all located in PPH. Three of the proposed wells (FRU 28-2, FRU 33-13 and FRU 11-14) are also located in PPH. The FRU 4-14 is not located within PPH or PGH. Access to the unit transects PPH. Due to lack of access from private land to the east, there is no way to access the unit except by going through PPH.

Table 7. Distance from proposed well sites/access roads to active leks (Miles)

Lek Name	FRU 28-2	FRU 33-13	FRU 4-14	FRU 11-14	Access Road
Squaw Mountain	0.66	1.37	2.31	3.60	0.66 (proposed)
W. Gibraltar 1	4.70	4.18	4.18	1.70	0.54 (existing)
W. Gibraltar 2	3.80	3.10	3.10	1.10	0.35 (existing)
W. Gibraltar 3	4.10	3.65	3.65	1.50	0.65 (existing)
W. Gibraltar 4	4.00	3.60	3.27	1.68	0.86 (existing)
Three Forks	5.30	4.80	4.80	2.30	1.00 (existing)

Columbian sharp-tailed grouse

Columbian sharp-tailed grouse habitat is comprised of mountain shrub-grassland communities and associated edges. Like greater sage-grouse, sharp-tailed grouse breed on leks in the spring and construct ground nests near or under shrubs. Sagebrush stands and mixed mountain shrublands in the FRU provide habitat for Columbian sharp-tailed grouse. Much of the area is classified as nesting and winter habitat by the CPW. There are seven active sharp-tailed grouse leks within the unit. The closest proposed well site is 0.80 miles from an active lek. However, the proposed re-route to the 12-1 well is 0.17 miles from an active lek. The existing road is 0.12 miles from the same lek.

Bald eagle

The general area is mapped as winter habitat for bald eagles by CPW. There are no nests or roosting sites in the vicinity of the proposed well sites. Bald eagles use upland habitats as scavenging areas primarily for winter or vehicle killed mule deer and elk.

Brewer's sparrow

Brewer's sparrows are a summer resident in Colorado and nest in sagebrush stands. Nests are constructed in sagebrush and other shrubs in denser patches of shrubs. This species would likely

be nesting in the project area from mid-May through mid-July.

Environmental Consequences, Proposed Action:

Colorado River fish

In May 2008, the BLM prepared a Programmatic Biological Assessment (PBA) that addresses water depleting activities associated with the BLM's fluid minerals program in the Colorado River Basin in Colorado. In response to the BLM's PBA, the FWS issued a Programmatic Biological Opinion (PBO) (ES/GJ-6-CO-08-F-0006) on December 19, 2008, which determined that the BLM water depletions from the Colorado River Basin are not likely to jeopardize the continued existence of the Colorado pike minnow, humpback chub, bonytail, or razorback sucker, and that the BLM water depletions are not likely to destroy or adversely modify designated critical habitat.

A Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin was initiated in January 1988. The Recovery Program serves as the reasonable and prudent alternative to avoid jeopardy and provide recovery to the endangered fishes by depletions from the Colorado River Basin. The PBO addresses water depletions associated with fluid minerals development on BLM lands, including water used for well drilling, hydrostatic testing of pipelines, and dust abatement on roads. The PBO includes reasonable and prudent alternatives developed by the FWS which allow the BLM to authorize oil and gas wells that result in water depletion while avoiding the likelihood of jeopardy to the endangered fishes and avoiding destruction or adverse modification of their critical habitat. As a reasonable and prudent alternative in the PBO, FWS authorized the BLM to solicit a one-time contribution to the Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin (Recovery Program) in the amount equal to the average annual acre-feet depleted by fluid minerals activities on BLM lands.

The four proposed wells would be entered into the LSFO fluid minerals water depletion log and would be submitted to the Colorado State Office at the end of the Fiscal Year.

Greater sage-grouse

Construction and operation of oil and gas facilities and associated roads may result in habitat loss, fragmentation, and degradation. The proposed action would result in the direct removal of approximately 43 acres of greater sage-grouse habitat. Removal of sagebrush would be minimal on a landscape level, but this disturbance would decrease habitat patch size and increase edge habitats. Approximately 20 acres of the surface disturbance would be linear and since sage-grouse require large blocks of intact habitat, linear disturbances can reduce habitat quality. Approximately 2.5 miles of road disturbance would be repetitive; 2.9 miles of abandoned original access road already exists on private land and would no longer be used by the proponent, but would still sustain traffic by the landowner. This would lead to additional fragmentation of sagebrush stands in the area. In addition to direct removal of habitat, surface disturbance can lead to weed infestations or may spread weeds where infestations already exist. Noxious and invasive weeds are of lower value to sage-grouse and degrade habitat by reducing optimal cover or food. The loss and degradation of sagebrush habitat can reduce the carrying capacity of local

breeding populations of grouse, especially in areas where high quality sagebrush habitat is limited (Braun 1998; Connelly et al. 2000).

Both the construction and operation phases of oil and gas development can lead to disruption impacts. Noise and an increase in human presence during construction and drilling may displace grouse into lower quality habitat and may disrupt breeding and nesting activities (Holloran 2005). Although construction impacts are generally short term, this disruption can have severe impacts if conducted during the lekking or nesting season. No surface disturbance, construction, or drilling would be permitted from March 1 to June 30 to reduce these impacts.

Construction and operation of oil and gas facilities may also lead to direct mortality of sage-grouse. An increase of traffic on roads associated with oil and gas facility maintenance and operations can lead to direct mortality through vehicle/grouse collisions. The potential for greater sage-grouse mortality from project construction would be low and likely limited to nesting hens or young chicks that have limited mobility. However, with the above mentioned timing limitation from March 1 to June 30, destruction of nests and eggs would be unlikely.

The following summary of impacts to greater sage-grouse from oil and gas development is from “A Report on National Greater Sage-Grouse Conservation Measures” produced by the Sage-grouse National Technical Team (2011):

Mechanisms that lead to avoidance and decreased fitness have not been empirically tested but rather suggested from multiple correlative and observational studies. For example, abandonment may increase if leks are repeatedly disturbed by raptors perching on power lines near leks (Ellis 1984), by vehicle traffic on nearby roads (Lyon and Anderson 2003), or by noise and human activity associated with energy development during the breeding season (Remington and Braun 1991, Holloran 2005, Kaiser 2006, Blickley and Patricelli In review). One recently completed research study in Wyoming (Blickley et al. In press), experimentally validates noise from natural gas drilling and roads resulted in a decline of 29% and 73% respectively in male peak attendance at leks relative to paired controls; declines were immediate and sustained throughout the experiment with low statistical support for a cumulative effect of noise over time. Collisions with nearby power lines and vehicles and increased predation by raptors may also increase mortality of birds at leks (Connelly et al. 2000). Alternatively, roads and power lines may indirectly affect lek persistence by altering productivity of local populations or survival at other times of the year. For example, sage-grouse mortality associated with power lines and roads occurs year-round (Beck et al. 2006, Aldridge and Boyce 2007), and ponds created by coal bed natural gas development may increase the risk of West Nile virus mortality in late summer (Walker et al. 2004, Zou et al. 2006, Walker et al. 2007b). Loss and degradation of sagebrush habitat can also reduce carrying capacity of local breeding populations (Swenson et al. 1987, Braun 1998, Connelly et al. 2000, 2000b, Crawford et al. 2004). Birds may avoid otherwise suitable habitat as the density of roads, power lines, or energy development increases (Lyon and Anderson 2003, Holloran 2005, Kaiser 2006, Doherty et al. 2008, Carpenter et al. 2010).

Negative responses of sage-grouse to energy development were consistent among studies regardless of whether they examined lek dynamics or demographic rates of specific cohorts

within populations. Sage-grouse populations decline when birds avoid infrastructure in one or more seasons (Doherty et al. 2008, Carpenter et al. 2010) and when cumulative impacts of development negatively affect reproduction or survival (Aldridge and Boyce 2007), or both demographic rates (Lyon and Anderson 2003, Holloran 2005, Holloran et al. 2010).

Avoidance of energy development at the scale of entire oil and gas fields should not be considered a simple shift in habitat use but rather a reduction in the distribution of sage-grouse (Walker et al. 2007). Avoidance is likely to result in true population declines if density dependence, competition, or displacement of birds into poorer-quality adjacent habitats lowers survival or reproduction (Holloran and Anderson 2005, Aldridge and Boyce 2007, Holloran et al. 2010). High site fidelity in sage-grouse also suggests that unfamiliarity with new habitats may also reduce survival, as in other grouse species (Yoder et al. 2004). Sage-grouse in the Powder River Basin were 1.3 times more likely to occupy winter habitats that had not been developed for energy (12 wells per 4 square kilometers or 12 wells per 1.5 square miles), and avoidance of developed areas was most pronounced when it occurred in high-quality winter habitat with abundant sagebrush (Doherty et al. 2008). In a similar study in Alberta, avoidance of otherwise suitable wintering habitats within a 1.9-kilometer (1.2 miles) radius of energy development resulted in substantial loss of functional habitat surrounding wells (Carpenter et al. 2010).

Long-term studies in the Pinedale Anticline Project Area in southwest Wyoming present the most complete picture of cumulative impacts and provide a mechanistic explanation for declines in populations. Early in development, nest sites were farther from disturbed than undisturbed leks, the rate of nest initiation from disturbed leks was 24% lower than for birds breeding on undisturbed leks, and 26% fewer females from disturbed leks initiated nests in consecutive years (Lyon and Anderson 2003). As development progressed, adult females remained in traditional nesting areas regardless of increasing levels of development, but yearlings that had not yet imprinted on habitats inside the gas field avoided development by nesting farther from roads (Holloran 2005). The most recent study confirmed that yearling females avoided infrastructure when selecting nest sites, and yearling males avoided leks inside of development and were displaced to the periphery of the gas field (Holloran et al. 2010). Recruitment of males to leks also declined as distance within the external limit of development increased, indicating a high likelihood of lek loss near the center of developed oil and gas fields (Kaiser 2006). The most important finding from studies in Pinedale was that sage-grouse declines are explained in part by lower annual survival of female sage-grouse and that the impact on survival resulted in a population-level decline (Holloran 2005). High site fidelity but low survival of adult sage-grouse combined with lek avoidance by younger birds (Holloran et al. 2010) resulted in a time lag of 3–4 years between the onset of development activities and lek loss (Holloran 2005). The time lag observed by Holloran (2005) in the Anticline matched that for leks that became inactive 3–4 years after natural gas development in the Powder River Basin (Walker et al. 2007a). Analysis of seven oil and gas fields across Wyoming showed time lags of 2–10 years between activities associated with energy development and its measurable effects on sage-grouse populations (Harju et al. 2010).

Impacts as measured by the number of males attending leks are most severe near the lek, remain discernible out to >4 miles (Holloran 2005, Walker et al. 2007, Tack 2009, Johnson et

al. 2011), and often result in lek extirpations (Holloran 2005, Walker et al. 2007). Negative effects of well surface occupancy were apparent out to 3.1 miles, the largest radius investigated, in 2 of 7 study areas in Wyoming (Harju et al. 2010). Curvilinear relationships show that lek counts decreased with distance to the nearest active drilling rig, producing well, or main haul road and that development within 3 to 4 miles of leks decrease counts of displaying males (Holloran 2005). All well-supported models in Walker et al. (2007) indicate a strong negative effect, estimated as proportion of development within either 0.5 miles or 2 miles, on lek persistence. A model with development at 4 miles had less support, but the regression coefficient indicated that negative impacts within 4 miles were still apparent. Two additional studies reported negative impacts apparent out to 8 miles on large lek occurrence (>25 males; Tack 2009) and out to 11.7 miles on lek trends (Johnson et al. 2011), the largest scales evaluated.

Inferring impacts from the above mentioned research, it is probable that impacts during drilling and construction activities can be mitigated with a timing limitation during the breeding and nesting season. However, drilling conducted at other times of the year may create enough disturbance that grouse would not come back to the area for the subsequent breeding season. Sage-grouse are also likely to be impacted long term by noise and disturbance from traffic and the long term occupancy of structures (tanks etc.) associated with development. Impacts would be more pronounced for development of the 2-28 well, the 11-14 well and the road re-route leading to the 12-1 well due to the proximity to active leks.

Although it is difficult to pinpoint the exact cause of lek attendance decreases, it is probable that development and associated traffic from the #12-1 well that was drilled in 2006 at least contributed to declines in lek attendance from 2006 to 2008. The access across this road and to the #12-1 well was revoked by the private land owner in the fall of 2009 and the well was shut in, so any declines in lek attendance cannot be attributed to traffic or noise from oil and gas development since that time. However, occupancy of oil and gas structures (tanks, etc.) could lead to avoidance of habitat within the area of the 12-1 well. A high percentage of leks in the NW Colorado population declined after the winter of 2007/2008. Several of these leks have rebounded since that time, but many have not, with no clear indication of factors influencing population recovery. In comparison, lek count numbers on the Fan Rock lek also decreased from 2008 to 2009. However, numbers have continually improved since that time. This lek is in the same zone as the West Gibraltar #3 lek. The Fan Rock lek is located just under 2 miles from the nearest oil and gas facility; however, it is located just under a quarter mile from a county road.

The Gibraltar lek complex has decreased in high male counts since the initial survey in 2004. Disturbance from construction of the rerouted access road into the 12-1 well, noise and disturbance from testing the 12-1 well and drilling the 11-14 well and an increase in traffic and human presence related to oil and gas activity would continue to stress sage-grouse in the area. This could lead to avoidance in the Gibraltar lek complex area and although the exact impact is unknown, could lead to abandonment of one or more leks in the complex. To reduce impacts to sage-grouse leks near the proposed well sites and roads, post development well site visits should not occur from 4pm to 9am during the breeding season (March 1 – May 15). Visits into the unit should also be reduced as much as possible during this time. Radio telemetry (or similar technologies) should also be used to monitor the well. In addition, mufflers would be required

on any equipment that produces sound/noise. These mitigation measures would reduce noise and disturbances to leks during the breeding season post development. Although this would not completely prevent impacts to the leks, it may potentially prevent some reduction in lek attendance due to operation activities.

Well surface occupancy impacts would also influence all five leks. The greatest potential for this impact would be to the Squaw Mountain lek, since the #28-2 well would be located just outside of the 0.60 NSO. All other well sites are located over a mile from the closest lek. Some screening from vegetation and topography would help reduce impacts from the 33-13 and the 4-14 wells.

The NTT Report (2011) recommends “where valid existing rights exist, minimize impacts by keeping disturbances to 1 per section with direct surface disturbance impacts held to 3% of the area or less. Based on aerial photos, a little over 500 acres of disturbance currently exists within the Focus Ranch Unit boundary. This gives the unit a current surface disturbance percentage of 1.37. Approximately 400 acres of this disturbance is located in PPH, with a 1.82% disturbance in PPH within the unit. The vast majority of this disturbance is linear and includes improved roads, two track roads and fence line. Oil and gas development would still be under 1 development per section, even with the four additional wells. However, more than 1 disturbance per section, primarily two-track road, already exists within the unit boundary.

LSFO met with Entek several times to determine which of many proposed wells would be least impacting to sage-grouse. In reviewing locations, the main focus was to keep development away from the 4-lek complex in the south eastern portion of the GAP. However, the main access road to the #12-1 well already encroaches upon the 0.60 mile NSO for the W. Gibraltar 1 (0.54 mile) and the W. Gibraltar 2 (0.35 mile) leks. When the road was constructed, the NSO for greater sage-grouse leks per the LSFO RMP was 0.25 mile. Since this well has already been drilled, the BLM has been working with the proponent to re-establish access to the #12-1 well and to portions of the unit where the proponent has valid and existing lease rights. Several other proposed locations were determined to have greater impacts to grouse and their habitat and these wells were dropped from analysis. One additional location north/east of the four lek complex has been deferred at this time. Since little is known about sage-grouse habitat use in the area (except lek locations), Entek has agreed to purchase or donate the funds to purchase five GPS collars. CPW would collar five grouse in the FRU GAP area to track habitat use. This information would be vital to future planning.

Columbian sharp-tailed grouse

Impacts to Columbian sharp-tailed grouse would be similar to impacts described in the greater sage-grouse section above.

Bald eagle

Impacts to bald eagles are described in the Migratory Birds section of this EA.

Brewer's sparrow

Impacts to Brewer's sparrows are described in the Migratory Bird section of this EA.

Mitigation:

- To mitigate impacts to greater sage-grouse and Columbian sharp-tailed grouse during the lekking and nesting season, no construction, drilling or completion activities will occur between March 1 and June 30. In addition, maintenance or operational activities that would be disruptive (i.e. cause loud noises or high levels of traffic) should not be undertaken from March 1 through May 31.
- Conduct post-development well site visits between the hours of 9:00 a.m. and 4:00 p.m. to prevent disturbances during the lekking season (March 1 to May 31). This COA applies to all four wells and access roads, including access to the FRU FED 12-1 and the FRU FED 3-1. Visits to well sites should also be limited as much as possible during this time.
- If any of the wells are brought into production, radio telemetry equipment (or other technologies) will be installed and utilized to remotely monitor the wells and reduce the number of trips that are needed to the well site.
- Install raptor perch deterrents on equipment, fences, cross arms and pole tops.
- To prevent long term impacts associated with noise, sound producing equipment (such as compressors or pump jacks) must be equipped with a hospital grade muffler or similar device which limits sound emissions to 49 decibels or less measured 30 feet from the source. Mufflers will be pointed upward to dissipate potential vibration.
- Entek has agreed to purchase or donate the funds to CPW to purchase 5 GPS collars for greater sage-grouse. Once purchased, CPW will collar 5 sage-grouse in the FRU. Tracking movements and habitat use by grouse in this area will be used for future development planning and would provide essential information for minimizing impacts to grouse within the unit.

Environmental Consequences, Modified Proposed Action: Impacts to Colorado River Fish, Brewer's sparrow and bald eagle would be reduced under this alternative when compared to the Proposed Action. Impacts to Columbian sharp-tailed grouse would be similar as impacts to greater sage-grouse described below.

Greater sage-grouse

Impacts to greater sage-grouse from oil and gas development are described above in the Proposed Action Section. Under the Modified Proposed Action, there would be no impacts from the 11-14 well and associated road or the 28-2 well and associated road. There would be no impacts from the 12-1 well access road past the 3-1 well.

The Modified Proposed Action would lead to an overall reduction in surface disturbance in sage-grouse habitat when compared to the Proposed Action. Under the Proposed Action, just under six miles of new road (including two-track upgrade) would be constructed in PPH. The

Modified Proposed Action would permit less than a mile of new road in PPH. Since there would be a reduction in linear disturbances, habitat fragmentation would also be reduced, with habitat patch size remaining intact in areas where development does not occur. In addition, the Modified Proposed Action would permit two wells instead of four, reducing the amount of disruption disturbances from drilling, maintenance and traffic within the Focus Ranch Unit.

Under this alternative, new road construction to the 12-1 well would not occur; therefore the impacts to the Gibraltar lek complex would be reduced. Development traffic would stop at the existing 3-1 well, which is 1.8 miles away from the W. Gibraltar #2 lek, the closest lek to the 3-1 well in the complex. The two most active leks in the complex are 2.4 and 2.8 miles from the existing 3-1 well. In addition, the 3-1 well is somewhat screened from the lek complex by vegetation (aspen and oakbrush). The two new wells that would be permitted under this alternative are 2.6 and 3.1 miles from the Gibraltar lek complex and are visually screened from the complex as well. Impacts to the Squaw Mountain lek would also be reduced under this alternative. Since the 28-2 well would not be permitted, the 33-13 well would be the closest well to this lek at 1.37 miles. This well would be semi-screened from the lek by aspen and topography, however, there would still be some impacts from the main access road from traffic. No drilling would be allowed from March 1 to June 30 to minimize disruption impacts during the breeding and nesting season. In addition, maintenance traffic would also be limited during this time. This alternative would not completely eliminate impacts to greater sage-grouse within the FRU-GAP area, since the already existing main access road transects PPH. However, impacts to sage-grouse and PPH would be substantially less than the Proposed Action.

Mitigation:

- To mitigate impacts to greater sage-grouse and Columbian sharp-tailed grouse during the lekking and nesting season, no construction, drilling or completion activities will occur between March 1 and June 30. In addition, maintenance or operational activities that would be disruptive (i.e. cause loud noises or high levels of traffic) should not be undertaken from March 1 through May 31.
- Conduct post-development well site visits between the hours of 9:00 a.m. and 4:00 p.m. to prevent disturbances during the lekking season (March 1 to May 31). This COA applies to all four wells and access roads, including access to the FRU FED 12-1 and the FRU FED 3-1. Visits to well sites should also be limited as much as possible during this time.
- If any of the wells are brought into production, radio telemetry equipment (or other technologies) will be installed and utilized to remotely monitor the wells and reduce the number of trips that are needed to the well site.
- Install raptor perch deterrents on equipment, fences, cross arms and pole tops.
- To prevent long term impacts associated with noise, sound producing equipment (such as compressors or pump jacks) must be equipped with a hospital grade muffler or similar

device which limits sound emissions to 49 decibels or less measured 30 feet from the source. Mufflers will be pointed upward to dissipate potential vibration.

- Entek has agreed to purchase or donate the funds to CPW to purchase 5 GPS collars for greater sage-grouse. Once purchased, CPW will collar 5 sage-grouse in the FRU. Tracking movements and habitat use by grouse in this area will be used for future development planning and would provide essential information for minimizing impacts to grouse within the unit.

Environmental Consequences, No Action Alternative: There would be no impacts to special status species or their habitat from the no action alternative.

Cumulative Impacts, Proposed Action and Modified Proposed Action: Past, current and future activities occurring in the area include livestock grazing and management, limited oil and gas development and recreation, primarily hunting. The proposed action represents an incremental increase in disturbances that may impact habitat for sensitive species habitat, primarily greater sage-grouse and Columbian sharp-tailed grouse. The removal of approximately 61 or 27 acres of sagebrush would not have a measureable influence on a landscape level; however, the proposed action would fragment sagebrush habitats and introduce new disruptions into the area. There is currently little development within the GAP area (three drilled wells within the approximately 38,000 acre unit). Although unknown at this time, potential for future development is probable. Due to limited access, there is currently little traffic on BLM-managed lands within the unit except for use by private land owners accessing their property and BLM livestock grazing permittees maintaining operations. Development would introduce a new disturbance to wildlife that utilize habitat in the area, potentially leading to decreased use of the GAP area.

Cumulative Impacts, No Action: There would be no contribution to previous or existing disturbances that would potentially impact special status species or their habitats under the no action alternative.

3.3.4 Upland Vegetation

Affected Environment: The primary upland plant communities existing in the proposed project area include big sagebrush and mountain shrub communities. Dominant species present include: mountain big sagebrush, silver sagebrush, green rabbitbrush, serviceberry, snowberry, mules-ears, Lewis flax, sego lily, yarrow, silver cinquefoil, Wood's rose, Louisiana sagewort, Indian paintbrush, scarlet globemallow wavy-leaf thistle, yampa, needle-and-thread, timothy, western wheatgrass, slender wheatgrass, squirreltail, mountain brome, Kentucky bluegrass, and Sandberg bluegrass.

Environmental Consequences, Proposed Action: While a 40+ acres loss of vegetation would be considered substantial in terms of the loss of native and desired vegetation, the distribution of the disturbance along with interim and final reclamation makes this standalone level of impact not adverse.

Environmental Consequences, Modified Proposed Action: While a reduction in acreage of disturbance and loss of native and desired vegetation would be preferred, the distribution of the disturbance along with interim and final reclamation makes this standalone level of impact not adverse.

Environmental Consequences, No Action Alternative: No adverse impact would be expected to occur as a result of the No Action Alternative.

Cumulative Impacts, Proposed Action and Modified Proposed Action: The continued and additional development of federal oil and gas resources and associated loss of vegetation would further reduce the diversity and abundance of natural seed sources within the FRU. Even with successful reclamation, substantial disruption of the natural succession of the upland plant community would have far reaching effects to natural and other permitted land uses.

Mitigation: Because all sites lie within BLM grazing allotments, all sites of non-linear disturbance should be fenced to BLM specifications during final reclamation. Any fencing would be in coordination with BLM wildlife biologist to assure that temporary fencing would not pose unnecessary threats to sage-grouse, and or, be marked appropriately. Temporary fencing would remain in place and maintained for a minimum of two growing seasons or until the BLM has determined that reclamation is satisfactory. The BLM preferred seed mix for interim and final reclamation on all sites should be as follows:

Plant Species	Lbs. of Pure Live Seed (PLS)/Acre
Western wheatgrass	2
Slender wheatgrass	2
Bluebunch wheatgrass	2
Mountain brome	1
Squirreltail	1
Western yarrow	0.5
Scarlet globemallow	0.5
Arrowleaf balsamroot	0.5
Total	9.5

Cumulative Impacts, No Action: There would be no contribution to previous or existing disturbances that would potentially impact upland vegetation or habitats under the no action alternative.

3.3.5 Wetlands and Riparian Zones

Affected Environment: The table below is a summary of riparian resources relevant to the construction of infrastructure proposed as part of the Proposed Action. All lotic resources were assessed in July 2011 as part of a grazing allotment review and found to be in functioning condition. Lentic resources have not been assessed in the last ten years.

Table 8.

	Riparian Resources Summary				
	FRU Federal Well #4-14	FRU Federal Well #11-14	FRU Federal Well #33-13	FRU Stull Well #28-2	Focus Ranch Middle Bypass Road
Lotic	None identified	Proposed pad site located 65' from Cantling Creek Headwater 2 (reach 4); intermittent	None identified	None identified	<ul style="list-style-type: none"> • Easternmost portion of road parallels Cantling Creek Headwater 2 (reaches 2&3) • Route crosses Cantling Creek Headwater 2 (reach 1)
Lentic	BLM Spring 015-21 located 700' downslope of proposed pad site	Proposed access road crosses small unnamed lentic draw	None identified	None identified	BLM Spring 015-02 located within 50' of proposed route

Environmental Consequences, Proposed Action: The Proposed Action includes modification of riparian resources at two locations. The Focus Ranch Middle Bypass Road crosses a section of intermittent stream (Cantling Creek Headwater 2, reach 1) and then proceeds to parallel the creek along highly erodible soils for about a mile towards FRU Federal 11-14. The access road to FRU Federal 11-14 also crosses an intermittent/ephemeral, unnamed drainage. The pad site for this well would be perched between two intermittent/ephemeral drainages, and would be situated approximately 65 feet from Cantling Creek Headwater 2 (reach 4). Culverts are proposed for the two crossings.

Riparian areas provide for channel stability via flood attenuation, reduce effects of storm events, stabilize banks, and maintain sediment transport and channel morphology. Erosion of the landscape and the resulting addition of sediment to streams is a naturally occurring process. Over time, stream and river channels form to effectively transport the sediment load produced by a watershed through its network of surface waters. However, when sediment loads are substantially increased in volume and/or frequency of loading, degradation of water quality, aquatic habitat quality and complexity, and channel stability are likely to occur. Increased sedimentation towards Cantling Creek and its unnamed intermittent tributaries during spring runoff or from high intensity rainstorms is a likely consequence given known soil instability issues (see Soils and Surface Water Quality analysis) and proximity to riparian resources. Undisturbed, these soils typically would remain relatively stable, experiencing slow movement over time. Once disturbed, erosion, heavy precipitation, and cut and fill slopes can activate or accelerate failures. Over time, any failure(s) of the pad and/or parts of the road are likely overwhelm the riparian system's ability to provide these services, causing a downward spiral of overall riparian condition and aquatic health downstream.

Due to the flashy nature of area drainages (i.e. streams that exhibit significantly increased flows immediately following the onset of a precipitation event and a rapid return to pre-rain conditions shortly after the end of the precipitation), highly erodible/unstable soils, and anticipated culvert maintenance, consultation with the U.S. Army Corps of Engineers is highly recommended.

Reference: Vermont Agency of Natural Resources. 2005. Riparian Buffers and Corridors Technical Papers. Waterbury, Vermont. 43 p.

Environmental Consequences, Modified Proposed Action: Impacts to riparian resources are largely eliminated under this alternative. Modification to riparian zones (culverts) in both perennial (Cantling Creek) and ephemeral drainages, as well as USACE consultation, is eliminated since FRU Federal 11-14 and its associated access and bypass roads would not be constructed. Total surface disturbance and the resulting impacts to riparian areas as described above would be reduced, particularly across fragile soils that are highly susceptible to erosion and structural failure. Overall, the Modified Proposed Action would result in reduced impacts when compared to the Proposed Action.

Environmental Consequences, No Action Alternative: Under this alternative, the Federal APDs would not be approved, and new/upgraded roads and proposed pads would not be constructed. Therefore, any additional negative impacts to riparian resources as related to construction, drilling, or completions would be eliminated.

Cumulative Impacts, Proposed Action and Modified Proposed Action:

Past, present, and reasonably foreseeable actions that affect riparian health, form, and function in the upper Little Snake River valley primarily include ranching, limited fluid mineral exploration and development, and the infrastructural development necessary to support these two activities.

The upper Little Snake River valley is characterized by wide valley bottoms with steep and rolling hillsides at the foot of the Elkhead Mountains. A network of perennial and ephemeral drainages occurs across the watershed, some of which have a parallel dirt or gravel road. Riparian vegetation condition on federal lands is quite good here, due to the relatively high levels of precipitation and perennial runoff the area receives.

The effect to riparian areas due to fluid mineral and infrastructural development is primarily sedimentation, a result of the construction and maintenance of roads and pads adjacent to riparian areas in the watershed. The addition of semi-permanent drainage crossings (culverts) to allow for heavy equipment access to fluid mineral development has also occurred in several of these drainages. These installations change the pattern and speed of runoff along the channel and could lead to changes in erosion rates and sediment movement below the culvert as well as impact movement of aquatic biota up and down the channel.

The portion of sediment that is delivered to the Little Snake River as a direct consequence of these developments is not known, but is likely to occur during the spring high flow period coincident with the natural sediment discharge peak as well as summer storm events. The presence of roads parallel to drainages can impact the systems' natural lateral movement over the long term by armoring and/or straightening banks and reducing any floodplain capability to moderate overbank flooding.

Where recent land health/riparian assessments are available, riparian standards are mostly being met on public lands. Roads adjacent to the floodplain or the presence of invasive species are usually cited as compromising riparian health in these instances. Livestock use of riparian areas on public lands is light, as private portions of the allotments include water developments,

fencing, and rotational grazing strategies that help to keep extended livestock use away from these sensitive areas. Riparian condition on private lands within the watershed is largely known, but is likely similar to that observed on public lands.

Cumulative Impacts, No Action: Past, present, and reasonably foreseeable actions that affect riparian health in the upper Little Snake River Valley is the same as described in the Proposed Action. Under this alternative, the potential impacts to riparian vegetation caused by ranching would remain the same. However, there would not be the additional surface disturbance caused by new road and pad construction (or upgrades/ maintenance of existing infrastructure) that could lead to an unnatural increase in sedimentation to perennial surface waters that could potentially overwhelm the ability of riparian vegetation to filter, store, and adapt to increased sediment loads. The semi-permanent modification of riparian zone form and function caused by culvert installation would also not occur.

Mitigation: For the purpose of maintaining and protecting water quality, stream stability, aquatic health, wildlife habitat, seasonal use, downstream fisheries, and downstream sediment processes as well as to minimize the risk of sedimentation, spills, and other contaminants reaching intermittent/ephemeral streams to protect water quality, stream function, and aquatic habitat:

- Excepting culverts as proposed, no surface occupancy (NSO) of 50 horizontal feet as measured from the top of the stream bank for all intermittent or ephemeral streams/drainages.
- Excepting culverts as proposed, controlled surface use from the edge of the NSO buffer up to 100 feet for all intermittent or ephemeral streams/drainages. Minimize locating roads, stream crossings, and facilities within this zone. Adequate professional design and engineering of activities within this zone is necessary to prevent stormwater runoff and sedimentation.
- Construction activities at perennial, intermittent, and ephemeral drainage crossings (e.g. burying pipelines, installing culverts) shall be timed to avoid high flow conditions. Construction that disturbs any flowing stream shall utilize either a piped stream diversion or a cofferdam and pump to divert flow around the disturbed area.

Culverts at drainage crossings shall be designed and installed to pass a 25-year or greater storm event. On perennial and intermittent streams, culverts shall be designed to allow for passage of aquatic biota. The minimum culvert diameter in any installation for a drainage crossing or road drainage shall be 24 inches. Crossings of drainages deemed to be jurisdictional waters of the U.S. pursuant to Section 404 of the Clean Water Act may require additional culvert design capacity. Due to the flashy nature of area drainages and anticipated culvert maintenance, the U.S. Army Corps of Engineers (USACE) recommends designing drainage crossings for the 100-year event. Contact the USACE Colorado West Regulatory Branch at 970-243-1199.

- The proponent shall restore temporarily disturbed wetlands or riparian areas. The proponent shall consult with the BLM LSFO to determine appropriate mitigation, including verification of native plant species to be used in restoration.

3.3.6 Wildlife (Terrestrial)

Affected Environment: Native plant communities in the area are comprised primarily of sagebrush stands with an understory of grasses and forbs and mountain shrublands. In addition, scattered aspen and mixed coniferous woodlands can be found within the GAP. These plant communities provide habitat for a variety of big game, small mammals, birds and reptiles. The proposed project area provides year round habitat for mule deer, elk, and pronghorn antelope. The northwestern portion of the GAP area is classified as winter habitat for both mule deer and elk; the FRU #28-2 and a small portion of the main access road (0.3 miles) re-route would be located in mule deer critical winter range. Wells FRU #33-13, FRU #4-14 and FRU #11-14 would all be located in elk production areas. Big game species are managed in Game Management Unit (GMU) 5 in this area.

Environmental Consequences, Proposed Action: Impacts to wildlife species from oil and gas development are discussed in the LSFO RMP EIS (October 2011). Impacts include, but are not limited to, displacement into less suitable habitat, increased stress and loss of habitat. These impacts are more significant during critical seasons, such as winter or reproduction. Big game species are often restricted to smaller areas during the winter months and may expend high amounts of energy to move through snow, locate food and maintain body temperature. Disturbances during the winter can displace big game, depleting much needed energy reserves and may lead to decreased over winter survival. Mule deer, pronghorn and elk using winter range are likely to be disturbed by noise and human activity associated with well pad construction and drilling. These activities should not be permitted from December 1 to April 30 in mule deer critical winter range to prevent significant impacts to this species. Drilling outside of the winter season would still disturb resident wildlife, however, due to the limited amount of activity in the surrounding area, it is suspected that local wildlife would have adequate forage and cover resources available outside the area of disruption.

If the wells are successful, long term occupancy of the well sites, coupled by an increase in human activity and traffic may continue to disturb big game species. An increase in traffic may also result in increased mortality to big game due to vehicle collisions. While development of four well pads would not likely have substantial influence on local big game populations, future increased and expansive development throughout the area has the potential to negatively impact big game. The amount of future development above the four proposed wells is unknown at this time.

Most small mammals, birds and reptiles using the project area would be capable of avoiding construction equipment and should not be directly harmed by these activities. Some burrowing animals may be killed by construction equipment. This should be considered a short-term negative impact that is not likely to harm populations of any species.

Mitigation:

- No surface disturbing activities between December 1 and April 30 in order to prevent disturbance of mule deer using critical winter range. This would apply to Well #28-2 and the access road associated with this well pad. This timing limitation also applies to the north portion of the access road leading to Well #33-13.
- Conduct post-development well site visitations to between the hours of 9 a.m. and 4:00 p.m. and reduce well site visitations between December 1 and April 30. This applies to access into the entire unit, since the main access road crossed both mule deer critical winter habitat and an elk winter concentration area.

Environmental Consequences, Modified Proposed Action: Impacts to wildlife species and their habitat would be reduced from this alternative when compared to the Proposed Action. Direct removal of vegetation would be reduced from 61 acres to 27 acres and linear disturbance would be reduced from ~8.25 miles to ~5.3 miles. Since there would be a reduction in linear disturbances, habitat fragmentation would also be reduced, with habitat patch size remaining intact in areas where development does not occur. The Proposed Action would permit four new wells and access to two existing wells. The Modified Proposed Action would permit two new wells and access to one existing well. This would reduce disruption impacts from noise associated with drilling and would reduce the amount of traffic associated with drilling and well maintenance. Overall, the Modified Proposed Action would result in reduced impacts when compared to the Proposed Action.

Mitigation:

- No surface disturbing activities between December 1 and April 30 in order to prevent disturbance of mule deer using critical winter range. This timing limitation applies to the north portion of the access road leading to Well #33-13.
- Conduct post-development well site visitations to between the hours of 9 a.m. and 4:00 p.m. and reduce well site visitations between December 1 and April 30. This applies to access into the entire unit, since the main access road crossed both mule deer critical winter habitat and an elk winter concentration area.

Environmental Consequences, No Action Alternative: There would be no impacts to terrestrial wildlife species or their habitat from the No Action Alternative.

Cumulative Impacts, Proposed Action and Modified Proposed Action: Past, current and future activities occurring in the area include livestock grazing and management, limited oil and gas development and recreation, primarily hunting. The Proposed Action in and of itself is not anticipated to contribute substantially to existing or proposed disturbances, nor is expected to have any measureable influence on local wildlife populations. While this would represent an incremental loss in big game winter range, there is currently little development within the GAP area (three drilled wells within the approximately 38,000 acre unit). Although unknown at this time, potential for future development is probable. Due to limited access, there is currently little

traffic within the unit except for use by private land owners. Development in the area would introduce a new disturbance to wildlife that utilize habitat in this area.

Cumulative Impacts, No Action: There would be no contribution to previous or existing disturbances that would potentially impact terrestrial wildlife species or their habitats under the No Action Alternative.

3.4 HERITAGE RESOURCES AND HUMAN ENVIRONMENT

3.4.1 Cultural Resources

Affected Environment: The BLM's approval of APDs to allow for well pad construction, upgrading or construction of access roads, and installation of buried pipelines is considered an undertaking subject to compliance with Section 106 of the National Historic Preservation Act (NHPA). The BLM has the legal responsibility to consider the effects of its actions on cultural resources located on federal land. BLM Manual 8100 Series; the Colorado State Protocol; and BLM Colorado Handbook of Guidelines and Procedures for Identification, Evaluation, and Mitigation of Cultural Resources provide guidance on Section 106 compliance requirements to meet appropriate cultural resource standards. Section 106 of NHPA requires federal agencies to: 1) inventory cultural resources within federal undertaking Areas of Potential Effect (APEs), 2) evaluate the significance of cultural resources by determining National Register of Historic Places (National Register) eligibility and, 3) consult with applicable federal, state, and tribal entities regarding inventory results, National Register eligibility determinations, and proposed methods to avoid or mitigate potential impacts to eligible sites.

In Colorado, the BLM's NHPA obligations are carried out under a Programmatic Agreement (PA) among the BLM, the Advisory Council on Historic Preservation, and the State Historic Preservation Officer (SHPO). Should an undertaking be determined to have "no effect" or "no adverse effect" by the BLM-LSFO archaeologist, the undertaking may proceed under the terms and conditions of the PA. If the undertaking is determined to have "adverse effects," project-specific consultation is then initiated with the SHPO.

The culture history of northwestern Colorado is presented among several recent context studies. Reed and Metcalf's (1999) study of the Northern Colorado River Basin provides applicable prehistoric and historic overviews as compiled by Frederic J. Athearn (1982) and Michael B. Husband (1984). A historical archaeology context also was prepared for the State of Colorado by Church and others (2007). Furthermore, significant cultural resources administered by the BLM-LSFO are provided in a Class 1 overview (McDonald and Metcalf 2006), in addition to valuable contextual data provided by synthesis reports of archaeological investigations conducted for a series of large pipeline projects in the BLM-LSFO management area (Metcalf and Reed 2011; Rhode and others 2010; Reed and Metcalf 2009).

Environmental Consequences, Proposed Action: National Register-eligible cultural resources—i.e., historic properties—may be subject to direct or indirect impacts as a result of construction and/or operational activities. The proposed action also has potential to detract from the visual

integrity of adjacent historic properties. Indirect effects to historic properties also may include increased access to/collection of artifacts and cultural materials, inadvertent trespass/damage to cultural resources, and possible degradation of the environmental setting.

The locations of the proposed well pads and access roads (the APE) were subject to Class III (intensive pedestrian) cultural resource investigations as documented in eight reports (Table 9).

Table 9. Prior Cultural Resource Surveys Conducted Within the APE.

Nº	Report Reference	Survey Location(s) & Acreage	Survey Results
1	Hammack, Laurens C. 2004. Cultural Resource Inventory: Clayton Williams Energy, Inc. Focus Ranch Unit Federal 12-1 Access Road, Moffat and Routt Counties, Northwestern Colorado. BLM-LSFO #67.2.2004.	FRU access road; 189.06 acres (BLM and private)	No sites in current APE
2	Darlington, David. 2010. <i>Class III Cultural Resource Report for the Entek GRB, LLC Focus Ranch Access Road Re-Alignment North and South Routes, Routt County, Colorado</i> . BLM-LSFO #12.51.2010, OAHP #RT.LM.R96. Western Archaeological Services, Inc., Rock Springs, Wyoming.	FRU access roads; 230.70 acres (BLM)	1 historic site; recommended not eligible
3	Darlington, David. 2012. <i>Class III Cultural Resource Inventory Report for the Entek GRB, LLC Focus Ranch Federal 33-13 Well Pad and Access Road, Routt County, Colorado</i> . BLM-LSFO #12.5.2012, OAHP #RT.LM.R105. Western Archaeological Services, Inc., Rock Springs, Wyoming.	#33-13 well pad and access road; 11.3 acres (BLM and private)	1 historic-age road segment; recommended not eligible
4	Darlington, David. 2012. <i>Class III Cultural Resource Inventory Report for the Entek GRB, LLC Focus Ranch Unit Federal 11-14 Well Pad and Access Road, Routt County, Colorado</i> . BLM-LSFO #12.7.2012, OAHP #RT.LM.NR152. Western Archaeological Services, Inc., Rock Springs, Wyoming.	#11-14 well pad and access road; 13.44 acres (BLM)	No sites
5	Werner, Heidi. 2012. <i>Class III Cultural Resource Inventory for the Entek GRB, LLC. FRU Stull Federal 28-1 Well Pad and Access Road, Routt County, Colorado</i> . BLM-LSFO #12.81.2012, OAHP #RT.LM.R108. Western Archaeological Services, Inc., Rock Springs, Wyoming.	Stull #28-1 (and #28-2) well pad and access road; 82.98 acres (BLM and private)	1 historic-age road segment; recommended not eligible
6	Busse, Jan. 2012. <i>Class III Cultural Resource Inventory for the Entek GRB Focus Ranch Unit Federal #4-14 Well Pad and Access Road, Routt County, Colorado</i> . BLM-LSFO #12.112.2012, OAHP #RT.LM.R111. Western Archaeological Services, Inc., Rock Springs, Wyoming.	#4-14 well pad and access road; 11.59 acres (BLM)	1 historic-age road segment; recommended not eligible
7	Busse, Jan. 2012. <i>Class III Cultural Resource Inventory for the Entek GRB Focus Ranch Unit #3-1 Alternate Access Road, Routt County, Colorado</i> . BLM-LSFO #12.113.2012, OAHP #RT.LM.R110. Western Archaeological Services, Inc., Rock Springs, Wyoming.	#3-1 alternate access road; 18.19 acres (BLM)	1 historic-age road segment and 1 historic site; both recommended not eligible
8	Busse, Jan. 2012. <i>Class III Cultural Resource Inventory for the Entek GRB, LLC FRU Stull Federal #28-2 Well Pad and Access Road, Routt County, Colorado</i> . BLM-LSFO #12.126.2012, OAHP #RT.LM.NR112. Western Archaeological Services, Inc., Rock Springs, Wyoming.	Stull #28-2 well pad and access road; 6 acres (private)	No sites

Three cultural resource sites were identified as a result of prior inventories including an historic-age livestock corral (5RT.2960), four segments of the historic Butter Lake wagon road (herein identified as a single resource; 5RT.3111), and a possible historic-age trough (5RT.3165). All documented cultural resources within the APE were recommended not eligible for National Register listing and no further assessment or consideration was warranted. The BLM-LSFO concurred with the adequacy of the above-listed cultural resource reports and the eligibility recommendations contained therein.

Because no significant (i.e., National Register-eligible) cultural resources were identified within the APE, the proposed undertaking may proceed with a project effect determination of “no historic properties affected.”

Environmental Consequences, Modified Proposed Action: Impacts to cultural resources under this alternative are reduced when compared to the Proposed Action.

Environmental Consequences, No Action Alternative: None.

Cumulative Impacts, Proposed Action and Modified Proposed Action: The cumulative effects to cultural resources are broad and may include impacts within the APE, the immediate vicinity, and/or the surrounding view-shed. Energy developments and resource extraction projects have potential to cause impacts as a result of construction, operational, and maintenance activities. Likewise, infrastructure has potential to detract from the integrity of cultural resources through physical disturbance (direct impacts) or degradation of the historical/environmental setting (indirect impacts). Increased utilization of the area also raises the potential for illegal collection of cultural materials. However, federal review of the proposed development triggers the need for cultural resources inventory and assessment; such investigations serve to augment the cultural-historical record and provide data to aid in the future identification and/or mitigation of newly identified sites.

Cumulative Impacts, No Action: Cultural resources are constantly subject to site formation processes or events after creation (Binford 1981; Schiffer 1987). These processes can be both cultural and natural, and may occur instantly or over thousands of years. Cultural formation processes include activities directly or indirectly caused by humans. Natural processes include chemical, physical, and biological processes of the natural environment that impinge upon and/or modify cultural materials.

Mitigation: Because no significant cultural resources were identified within the APE, the proposed undertaking may proceed with a project effect determination of “no historic properties affected.” The following Standard Discovery Stipulations apply:

1. Any cultural and/or paleontological (fossil) resource (historic or prehistoric site or object) discovered by the holder, or any person working on his behalf, on public or Federal land shall be immediately reported to the BLM AO. Holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the BLM AO. An evaluation of the discovery will be made by the BLM AO to determine appropriate actions to prevent the loss of significant cultural or scientific values. The

holder will be responsible for the cost of evaluation and the BLM AO will make any decision as to proper mitigation measures after consulting with the holder.

2. The proponent is responsible for informing all persons who are associated with the operations that they will be subject to prosecution for knowingly disturbing historic or archaeological sites, or for collecting artifacts. If historic or archaeological materials are encountered or uncovered during any project activities, the proponent is to immediately stop activities in the immediate vicinity of the find and immediately contact the AO at (970) 826-5000. Within five working days, the AO will inform the proponent as to:
 - Whether the materials appear eligible for the National Register of Historic Places;
 - The mitigation measures the proponent will likely have to undertake before the identified area can be used for project activities again; and
 - Pursuant to 43 CFR 10.4(g) (Federal Register Notice, Monday, December 4, 1995, Vol. 60, No. 232) the holder of this authorization must notify the AO, by telephone at (970) 826-5000, and with written confirmation, immediately upon the discovery of human remains, funerary items, sacred objects, or objects of cultural patrimony. Further, pursuant to 43 CFR 10.4(c) and (d), you must stop activities in the vicinity of the discovery and protect it for 30 days or until notified to proceed by the AO.
3. If the proponent wishes, at any time, to relocate activities to avoid the expense of mitigation and/or the delays associated with this process, the AO will assume responsibility for whatever recordation and stabilization of the exposed materials may be required. Otherwise, the proponent will be responsible for mitigation costs. The AO will provide technical and procedural guidelines for the conduct of mitigation. Upon verification from the AO that the required mitigation has been completed, the proponent will then be allowed to resume construction.

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1987 *Formation Processes of the Archaeological Record*. University of New Mexico Press, Albuquerque.

3.4.2 Hazardous or Solid Wastes

Affected Environment: Air, water, soil, and biological resources may potentially be affected by an accidental release of hazardous materials during transportation to and from the Project Area, storage, and use in construction and operations. Sensitive areas for hazardous materials releases include areas adjacent to water bodies, above aquifers, and areas where humans or wildlife would be directly impacted.

The most pertinent of the Federal laws dealing with hazardous materials are as follows:

- The Oil Pollution Act (Public Law 101-380, August 18, 1990) prohibits discharge of pollutants into waters of the US, which by definition would include any tributary, including any dry wash that eventually connects with the Colorado River.
- The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (42 U.S.C. 9601–9673), provides for liability, risk assessment, compensation, emergency response, and cleanup (including the cleanup of inactive sites) for hazardous substances. The act requires federal agencies to report sites where hazardous wastes are or have been stored, treated, or disposed of, and requires responsible parties, including federal agencies, to clean up releases of hazardous substances.
- The Resource Conservation and Recovery Act (RCRA), as amended by the Federal Facility Compliance Act of 1992 (42 U.S.C. 6901–6992), authorizes the EPA to manage, by regulation, hazardous wastes on active disposal operations. The act waives sovereign immunity for federal agencies with respect to all federal, State, and local solid and hazardous waste laws and regulations. Federal agencies are subject to civil and

administrative penalties for violations and to cost assessments for the administration of the enforcement.

- The Emergency Planning and Community Right-To-Know Act of 1986 (42 U.S.C. 11001–11050) requires the private sector to inventory chemicals and chemical products, report those in excess of threshold planning quantities, inventory emergency response equipment, provide annual reports and support to local and State emergency response organizations, and maintain a liaison with the local and State emergency response organizations and the public.

Environmental Consequences, Proposed Action: The Proposed Action would fall under environmental regulations that impact disposal practices and impose responsibility and liability for protection of human health and the environment from harmful waste management practices or discharges. A direct impact would occur if a solid waste or hazardous material is discarded and contaminates land surface either by solid, semi-solid, liquid, or contained gaseous material. Hazardous, civil, and criminal penalties may be imposed if the waste is not managed in a safe manner, and according to EPA regulations.

Mitigation: These laws, regulations, standard lease stipulations, and contingency plans and emergency response resources are expected to adequately mitigate any potential hazardous or solid waste issues associated with the proposed action.

Environmental Consequences, Modified Proposed Action: Impacts under this alternative are reduced when compared to the Proposed Action.

Environmental Consequences, No Action Alternative: Under the No Action alternative, because no drilling or construction activities would be permitted there would be no effects.

Cumulative Impacts, Proposed Action and Modified Proposed Action: Historic and continued energy development in the area would not likely have an additive effect on the amount of solid or hazardous waste introduced in the environment if laws and regulations are followed and enforced.

Cumulative Impacts, No Action: Historic and continued energy development in the area would not likely have an additive effect on the amount of solid or hazardous waste introduced in the environment if laws and regulations are followed and enforced.

3.4.3 Native American Religious Concerns

Affected Environment: Four Native American tribes have cultural and historical ties to lands administered by the BLM-LSFO. These tribes include the Eastern Shoshone, Ute Mountain Ute, Uinta and Ouray Agency Ute, and the Southern Ute.

American Indian religious concerns are legislatively considered under several acts and Executive Orders including the American Indian Religious Freedom Act, the Native American Graves Environmental Assessment Protection and Repatriation Act, and Executive Order 13007 (Indian Sacred Sites). In sum, and in concert with other provisions such as those found in the NHPA and

Archaeological Resources Protection Act, these acts and orders require the federal government to carefully and proactively consider the traditional and religious values of Native American culture and lifeways to ensure, to the greatest degree possible, that access to sacred sites, treatment of human remains, the possession of sacred items, conduct of traditional religious practices, and the preservation of important cultural properties are not unduly infringed upon. In some cases, these concerns are directly related to “historic properties” and “archaeological resources.” Likewise, elements of the landscape without archaeological or human material remains also may be involved. Identification of Native American concerns is normally completed during land-use planning efforts, reference to existing studies, or through direct consultation with tribes.

Consultation for the type of proposed undertaking is consulted on annually with the aforementioned tribes. Letters were sent to the tribes in the spring of 2012 describing general oil and gas development projects planned for FY2013. No comments were received. Project-specific consultation is typically not conducted unless activities are proposed within a previously identified area of tribal concern or if an undertaking may involve culturally significant items, sites and/or landscapes.

Environmental Consequences, Proposed Action: Items, sites, or landscapes determined as culturally significant to the tribes can be directly or indirectly impacted. Direct impacts may include, but are not limited to, physical damage, removal of objects or items, and activities construed as disrespectful (e.g., installation of portable toilets near a sacred site). Indirect impacts may include, but are not limited to, prevention of access (hindering the performance of traditional ceremonies and rituals), increased visitation of an area, and potential loss of integrity related to religious feelings and associations.

There are no known items, sites, or landscapes determined as culturally significant to the tribes within or adjacent to the APE. The proposed action does not prevent access to any known sacred sites, prevent the possession of sacred objects, or interfere with the performance of traditional ceremonies and/or rituals.

Environmental Consequences, Modified Proposed Action: Impacts under this alternative are reduced when compared to the Proposed Action.

Environmental Consequences, No Action Alternative: None.

Cumulative Impacts, Proposed Action and Modified Proposed Action: Continued energy development in the area has the additive effect of altering the landscape from that ancestrally known by the tribes. No specific sites were identified within the APE or surrounding vicinity, however, the overarching concern is for the cumulative effects that modern culture/developments cause upon the landscape.

Cumulative Impacts, No Action: There would be no contribution to previous or existing disturbances that would potentially impact Native American religious concerns under the No Action Alternative.

Mitigation: There are no known adverse impacts to any culturally significant items, sites, or landscapes. If new information is provided by consulting tribes, additional or edited terms and conditions for mitigation may be required to protect resource values.

3.4.4 Paleontological Resources

Affected Environment: Occurrences of paleontological resources are closely tied to the geologic unit that contains them. The probability for finding paleontological resources can be broadly predicted from the geologic units present at or near the surface. The Potential Fossil Yield Classification (PFYC) system classifies geologic units based on the relative abundance of vertebrate fossils or scientifically significant invertebrate or plant fossils and their sensitivity to adverse impacts. The higher PFYC Class number indicates a higher potential for finding paleontological resources. Geologic formations at or near the surface in the area of the proposed action consist of Tertiary Age Browns Park Formation (Tbp), PFYC Class 5 and Cretaceous Age Lewis Shale (Kls) PFYC Class 3. The PFYC Class 5 is considered to be highly fossiliferous and would predictably produce vertebrate fossils or scientifically significant invertebrate or plant fossils, and that are at risk of human-caused adverse impacts or natural degradation

Environmental Consequences, Proposed Action: The potential for discovery of significant fossils within the Browns Park formation is considered to be very high. The potential for discovery of significant fossils within the Lewis Shale formation is considered to be moderate. If any such fossils of paleontological interest are located, construction activities could damage the fossils and the information that could have been gained from them would be lost. The significance of this impact would depend upon the significance of the fossil. The proposed action could also constitute a beneficial impact to paleontological resources by increasing the chances for discovery of scientifically significant fossils.

Environmental Consequences, Modified Proposed Action: The potential for discovery of significant fossils is the same as the Proposed Action. The 4-14 is in Tbp, PFYC Class 5, and the 33-13 is in the Kls, PFYC Class 3.

Environmental Consequences, No Action Alternative: Under the No Action alternative, because no ground disturbance would occur, there would be no effects to paleontological resources.

Cumulative Impacts, Proposed Action and Modified Proposed Action: The cumulative impacts to the moderate potential for significant fossil discovery are broad within the project area and adjacent to the project area. To date, there have been fossil discoveries recorded. Continued activity could prove additional discoveries.

Cumulative Impacts, No Action: There would be no contribution to previous or existing disturbances that would potentially impact paleontological resources under the No Action Alternative.

Mitigation: Areas that contain geologic formations that are PFYC 3, 4, and 5, for which new surface disturbance is proposed on or adjacent to bedrock (native sedimentary stone) including disturbance

that may penetrate protective soil cover and disturb bedrock, may be subject to an inventory that shall be performed by a BLM permitted paleontologist and approved by the appropriate LSFO specialist. Surface disturbing activities in many areas including PFYC 4 and 5 may also require monitoring by a permitted paleontologist.

Ceasing operations and notifying the Field Office Manager immediately upon discovery of a fossil during construction activities would be required. Appropriate measures to mitigate adverse effects to significant paleontological resources would be determined by the BLM Authorized Officer (AO) after consulting with the proponent. The proponent would be responsible for the cost of any investigation necessary for the evaluation and for any mitigation measures. The proponent may not be required to suspend operations if activities can avoid further impacts to a discovered site or be continued elsewhere, however, the discovery shall be brought to the attention of the BLM AO as soon as possible and protected from damage or looting. (modified from 43CFR3802.3-2(f)(2), 43CFR3809.420(b)(8), and BLM IM 2009-011). An assessment of the significance is made and a plan to retrieve the fossil or the information from the fossil is developed.

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3.5 RESOURCE USES

3.5.1 Access and Transportation

Affected Environment: FLPMA provides for recreational use of public land as part of multiple use management. Dispersed, unstructured activities typify the recreational uses occurring on most public land. The Fly Creek SRMA is a high quality big game habitat and travel restrictions are in place to adequately protect natural resources on public land, minimize conflicts with other uses, prevent trespass problems, and ensure public safety. This area is open to recreational activities include big and small game hunting, backpacking, horseback riding, hiking, and sightseeing.

Environmental Consequences, Proposed Action: The construction of new roads within a travel restricted area could promote future unauthorized use and off-road travel and could contribute to impacts to environmental values, wildlife, cultural and paleontological resources.

Environmental Consequences, Modified Proposed Action: Impacts to access and transportation would be the same under the Modified Proposed Action but to a lesser degree.

Environmental Consequences, No Action Alternative: There would be no impacts from the No Action Alternative.

Cumulative Impacts, Proposed Action and Modified Proposed Action: Cumulative impacts of the road construction to the wells are minimal. There are many non-system roads in the area that are

somewhat inaccessible to the public as there are locked gates and signs which designate the roads as for “administrative use” only.

Cumulative Impacts, No Action: There would be no contribution to previous or existing disturbances that would potentially impact access and transportation under the No Action Alternative.

Mitigation: While the goal of the travel management program is to provide appropriate access for BLM permittees and lessees and to provide for administrative access for management of public lands, travel restrictions help to ensure that unrestricted motorized vehicle use does not occur. To prevent unauthorized use of non-designated roads, the lessee would ensure that the gate(s) leading to the wells are locked at all times, and the roads leading to the wells would be posted by the BLM as “Authorized Use Only.” The lessee would notify the BLM if unauthorized use occurs.

3.5.2 Livestock Operations

Affected Environment: The Proposed Action would occur within three BLM Grazing Allotments:

Allotment	Authorized AUMs	Well #
North Yahoo Mountain #04019	274	33-13
North Yahoo Mountain #04019	274	28-2
Yahoo Mountain #04020	391	04-14
Three Forks #04002	2,627	11-14

The Focus Ranch Bypass road also affects all three allotments. All three allotments are grazed by cattle during the spring to fall season.

Environmental Consequences, Proposed Action: Impacts to livestock operations include: poor or disrupted livestock distribution due to construction or operation activities, temporary loss of forage, injury or death resulting from construction or operation activities, potential loss or trespass of livestock due to compromised fencing or gates being left open. The project proponent should make efforts to work with the livestock operator to address and mitigate any potential livestock operation disruptions.

Environmental Consequences, Modified Proposed Action: Impacts to livestock operations would be the same under the Modified Proposed Action, but to a lesser degree.

Environmental Consequences, No Action Alternative: No adverse impacts.

Cumulative Impacts, Proposed Action and Modified Proposed Action: The continued and additional development of federal oil and gas resources and associated loss of vegetation would further reduce the diversity and abundance of available forage within the FRU. Even with

successful reclamation substantial disruption of the natural succession of the upland plant community would have far reaching effects to natural and other permitted land uses.

Cumulative Impacts, No Action: There would be no contribution to previous or existing disturbances that would potentially impact livestock operations under the No Action Alternative.

Mitigation: Because all sites lie within BLM grazing allotments, all sites of non-linear disturbance should be fenced to BLM specifications during final reclamations. Temporary fencing would remain in place and maintained for a minimum of two growing seasons or until the BLM has determined that reclamation is satisfactory. If the livestock operator can identify obvious hazards that could result in harm or death to livestock during construction or operation activities, additional fencing may be required.

CHAPTER 4– PUBLIC LAND HEALTH STANDARDS DETERMINATION

4.1 INTRODUCTION

In January 1997, Colorado BLM approved the Standards for Public Land Health. The five standards cover upland soils, riparian systems, plant and animal communities, threatened and endangered species, and water quality. Standards describe conditions needed to sustain public land health and relate to all uses of the public lands. Environmental analyses of proposed projects on BLM land must address whether the Proposed Action or alternatives being analyzed would result in impacts that would maintain, improve, or deteriorate land health conditions identified in the applicable Land Health Assessment (LHA).

4.2 COLORADO PUBLIC LAND HEALTH STANDARDS

The area of Proposed Action was assessed for Land Health Standards during the Slater Landscape Health Assessment in 1999/2000 by an interdisciplinary team consisting of BLM Wildlife Biologist, Rangeland Management Specialist, and Ecologist. The North Yahoo Mountain Allotment #04019 was reassessed in 2009 and the Three Forks Allotment #040002 was reassessed in 2011.

4.2.1 Standard 1

Upland soils exhibit infiltration and permeability rates that are appropriate to soil type, climate, land form, and geologic processes.

Finding of most recent assessment: A formal Land Health Assessment (LHA) was completed in 2009 and 2011 in the area of the Proposed Action, as stated above. Standard 1 for Upland Soils is currently being met at all sites.

Proposed Action: With careful road and pad design and maintenance, topsoil handling procedures, erosion control methods, and restoration measures during construction and restoration activities, the Proposed Action would not prevent the area from meeting Standard 1. However, the probability of this standard not being met over the entire project area will increase with each additional disturbance, particularly where that disturbance occurs on fragile soils.

Modified Proposed Action: With successful road and pad design and maintenance, topsoil handling procedures, erosion control methods, and restoration measures during construction and restoration activities, the Modified Proposed Action would not prevent the area from meeting Standard 1, particularly since disturbance across fragile soils is more limited than in the Proposed Action.

No Action Alternative: There would be no action authorized that would have potential to impact soils. This standard would continue to be met.

4.2.2 Standard 2

Riparian systems associated with both running and standing water function properly and have the ability to recover from major disturbance such as fire, severe grazing, or 100-year floods.

Finding of most recent assessment: A Proper Functioning Condition assessment was conducted as part of the Three Forks Allotment renewal assessment in 2011. All resources were found to be meeting this standard.

Proposed Action: With proper culvert installation and maintenance, restoration/revegetation of disturbed streambanks and channels, reinforced erosion and sedimentation control techniques, and spill prevention techniques (see COAs), the Proposed Action would not prevent this standard from being met. However, the probability of this standard not being met over the entire project area will increase with each additional disturbance, particularly where that disturbance occurs across highly erodible or unstable (fragile) soils.

Modified Proposed Action: With proper application of erosion, sedimentation control, and spill prevention techniques (see COAs), the Proposed Action would not prevent this standard from being met.

No Action Alternative: There would be no action authorized that would have potential to influence riparian zones and wetlands. This standard would continue to be met.

4.2.3 Standard 3

Healthy, productive plant and animal communities of native and other desirable species are maintained at viable population levels commensurate with the species and habitat's potential.

This standard is currently being met for productive animal and plant communities.

The FRU GAP area provides habitat for several wildlife species. The Proposed Action would alter a small amount of wildlife habitat. Although this disturbance would be minimal on a landscape level, it would decrease patch size and may degrade habitat on a small scale. Since there are only three other oil and gas developments in the area, four additional wells would not be expected to preclude this standard from being met. The probability of this standard not being met will increase with each additional disturbance.

The No Action Alternative would continue to meet this standard.

4.2.4 Standard 4

Special status, threatened and endangered species (federal and state), and other plants and animals officially designated by the BLM, and their habitats are maintained or enhanced by sustaining healthy, native plant and animal communities.

Finding of most recent assessment: This standard is currently being met.

Proposed Action: The FRU GAP area provides habitat for several special status species, including greater sage-grouse, Columbian sharp-tailed grouse, Brewer's sparrow and bald eagle. The Proposed Action would alter a small amount of special status species habitat. Although this disturbance would be minimal on a landscape level, it would decrease patch size and may degrade habitat on a small scale. Since there are only three other oil and gas developments in the area, four additional wells would not be expected to preclude this standard from being met. The probability of this standard not being met will increase with each additional disturbance.

No Action Alternative: The No Action Alternative would continue to meet this standard.

4.2.5 Standard 5

The water quality of all water bodies, including ground water where applicable, located on or influenced by BLM lands will achieve or exceed the Water Quality Standards established by the State of Colorado.

Finding of most recent assessment: Water quality in stream segments in the proposed project area are meeting state standards and therefore meeting LHA Standard 5.

Proposed Action: With the implementation of proper techniques for crossing streams, restoration/revegetation of disturbed streambanks and channels, reinforced erosion and sedimentation control techniques, and spill prevention techniques (see COAs), the Proposed Action would not prevent this standard from being met. However, the probability of this standard not being met over the entire project area will increase with each additional disturbance, particularly where that disturbance occurs across highly erodible or unstable (fragile) soils.

Modified Proposed Action: With the implementation of erosion, sedimentation control, and spill prevention techniques (see COAs), the Modified Proposed Action would not prevent this standard from being met.

No Action Alternative: There would be no action authorized that would have potential to influence surface water quality. This standard would continue to be met.

CHAPTER 5– COORDINATION AND CONSULTATION

PERSONS/AGENCIES CONSULTED: The BLM and CPW coordinated to determine what appropriate lease stipulations and COAs should be applied. The landowners/permittees and Routt county planning were in attendance at the onsite inspections.

The BLM-LSFO performs annual consultation with the following tribes: the Eastern Shoshone, Ute Mountain Ute, Uinta and Ouray Agency Ute, and the Southern Ute. Letters were sent to the tribes in the spring of 2012 describing general oil and gas development projects. No comments

were received. Project-specific consultation is typically not conducted unless activities are proposed within a previously identified area of tribal concern or if an undertaking may involve culturally significant items, sites and/or landscapes.

SIGNATURE OF PREPARER: Shawn Wiser /s/

SIGNATURE OF ENVIRONMENTAL REVIEWER:

DATE SIGNED:

Attachments: Attachment A Conditions of Approval
Attachment B Maps & Plats
Attachment C Master Stormwater Plan
Attachment D Soils Table

DRAFT